Safety Maintenance

EST. 1901 • AMERICA'S PIONEER INDUSTRIAL SAFETY MAGAZINE • APRIL, 1960 • 50¢
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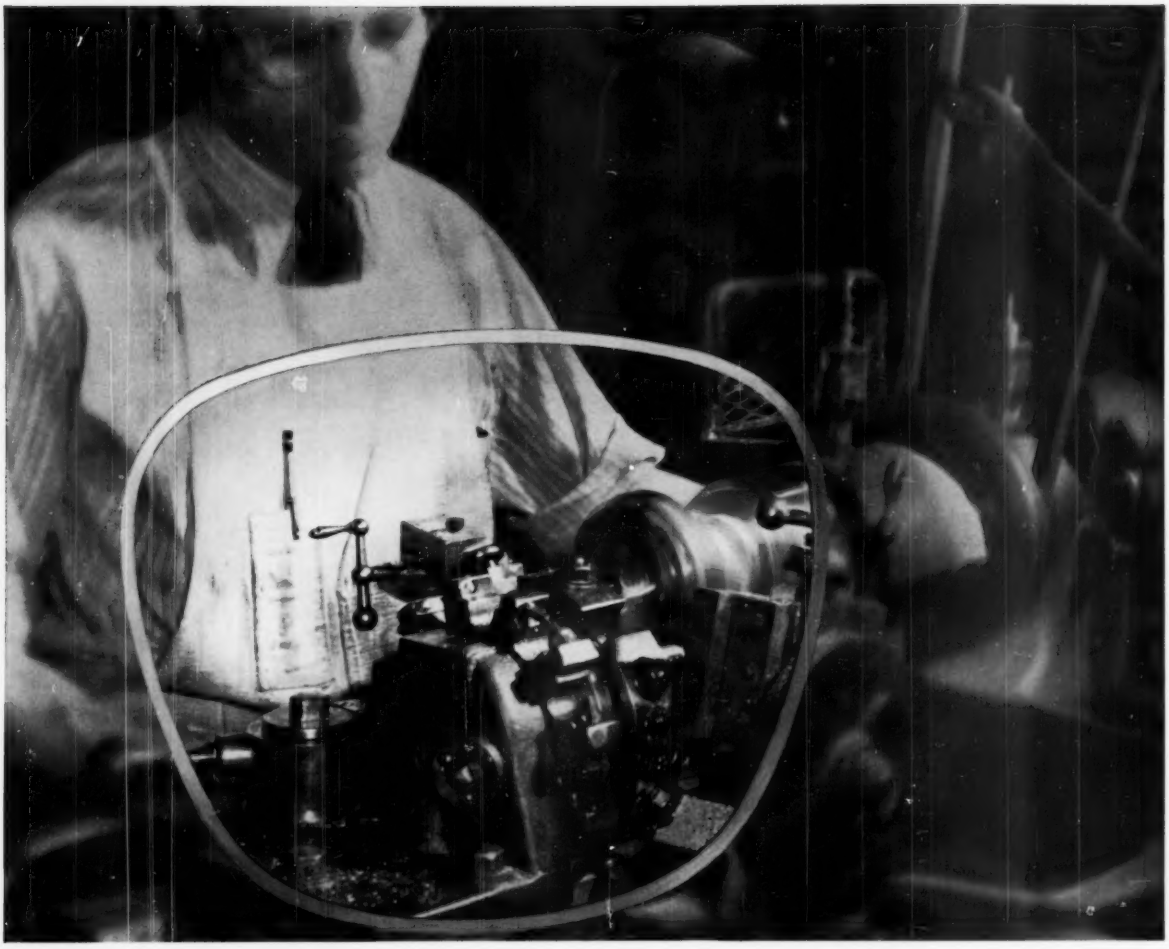

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(For details, use Key # Q-1 on card on page 1)

BULLETINS & CATALOGS

As a convenience to executives, these new publications of manufacturers are offered by the Reader Service Department of SAFETY MAINTENANCE. To obtain copies write in the key numbers on the free-postage card below.

LIGHTING & ELECTRICAL

Explosion-Proof Automatic Emergency Lights 292
Carpenter Mfg. Co. This illustrated catalog sheet describes self-contained emergency lights for hazardous locations, containing highly volatile liquids or gases such as alcohol, gasoline, propane, natural gas, etc. Battery-operated unit goes on automatically if regular lighting fails, and recharges automatically. Complete housing, test switch, and globe are explosion proof.

Emergency Floodlights 293
Stonco Electric Products Co. This 10-page catalog illustrates a complete line of lightweight, heavy-duty and vaportight cast-aluminum portable floodlights for use by contractor crews, night construction teams, public utilities and emergency squads. Also includes portables finished in red for fire departments, airports, etc.

Self-Grounding Power Connectors 294
A. P. M. Corp. This bulletin illustrates and describes a flat, armored power connector with a pivotally-mounted grounding blade to provide automatic grounding when plugged into either 2- or 3-way receptacles. In former, the spring-loaded blade deflects to make grounding contact with the faceplate.

Drip-Proof Motors 295
Sterling Electric Motors, Inc. A new type of multi-shielded drip-proof motor is described in this illustrated bulletin, which highlights 5 design features and shows how motors can be used to replace totally-enclosed units in many applications subject to moisture, humidity, dust, oil, and chemicals.

Automotive Lighting & Safety Equipment 296
R. E. Dietz Co. A new 36-page catalog describes more than 40 products. Catalog illustrates each product and lists basic components and replacement parts.

FIRE PROTECTION

Back-Pack Fire Extinguisher 297
D. B. Smith Co. This illustrated bulletin describes a pump type tank holding 5 gallons of water for fire extinguishing purposes. The equipment includes shoulder straps so that the unit can be carried on the back, making it particularly suitable for outdoor brush fires and large plants where portability is important.

Fire Hose Cabinets 298
W. D. Allen Mfg. Co. Illustrated bulletin describes and gives specifications for a line of fire hose cabinets that feature a rack installed on the door to prevent snagging of the hose when it is withdrawn during a fire emergency.

PERSONAL PROTECTIVE EQUIPMENT

Automatic Glove Dispenser 299
Arlington Industries, Inc. This 4-page brochure shows how to have work gloves readily available for employees yet under effective administrative control, through the use of token-operated dispensers. It is designed to fit any work glove program where gloves are provided free or sold to employees at cost.

Safety Equipment Catalog 300
Willson Products Co. Unusually attractive and complete safety equipment catalog which divides products into four general categories: 1. eye protection, 2. respiratory protection, 3. hearing protection, 4. head protection. The 70-page catalog includes detailed product descriptions and charts recommending specific equipment for each type of hazard.

How to Fit Safety Shoes 301
Hy-Test Safety Shoes. Well illustrated booklet describes how to fit safety shoes on industrial workers, using step-by-step instructions for accurate measurements of the arch, toe length and foot width. Also gives common mistakes and how to avoid them; and includes chart showing how to maintain balanced inventory of safety shoes.

FIRST AID AND HYGIENE

Marine First Aid Kits 302
Pac-Kit Co. This bulletin describes several types of unitized first aid kits suitable for use on boats. The water-tight kits are designed so that they will float on water. Various sizes available for open boats and cabin cruisers.

Protective Skin Cream 303
Duke Laboratories, Inc. An emollient dermatitis preventive is described in this folder. The product is designed to lubricate and protect the skin from organic solvents and other chemicals.

Antiseptic Soap 304
Davis-Weil Mfg. Co., Inc. An antiseptic liquid hand soap, which can be used with or without water, is described in this bulletin, which states that the soap contains lanolin and other softening ingredients to prevent the drying and chapping of the skin surface.

(Continued on the next page)

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Free Bulletins (Cont'd)

MATERIALS HANDLING

Magnesium Dockboards & Ramps.. 305
Magnesium Products of Milwaukee. Illustrated brochure gives practical engineering data and charts for magnesium dockboards and ramps to fit all rail and truck uses. Includes instructions for determining axle capacity, width and allowances, underclearances, height differentials, etc., and covers both standard and job-engineered applications.

Explosion-Proof Trucks 306
Clark Equipment Co. Three explosion-proof battery powered fork trucks for use in hazardous locations containing gasoline, naphtha, alcohols, propane, natural gas and similar vapors are described and illustrated in a 4-page folder. Includes dimensional data and engineering specifications and safety features.

Mobile Loading Ramps 307
Maglino, Inc. This engineering bulletin details the development of a line of mobile loading ramps into an integrated system of ground level loading for plant-wide shipping or receiving. Versatile system permits spotting of shipments at exact areas where required. Bulletin outlines typical problems: ground level plants, limited dock facilities, scattered buildings, production line feeding, outlying railcar loading, etc.

PLANT MAINTENANCE

Roofing Guide 308
Monroe Co. This manual describes and illustrates 14 common roof problems and recommends repairs and maintenance to overcome each. Includes flashing damage, alligatored, blistered, torn and open seams. Various roof types are covered in detail.

Centralized Lubrication Systems .. 309
Farval Div., Easton Mfg. Co. Revised brochure contains data on a complete line of centralized systems of lubrication. The 24-page booklet covers additions to the line, gives advantages and principles of operation, and illustrates typical applications.

What's YOUR Problem?

- **Has an accident or fire interrupted production?**
- **Want to know how to prevent it?**
- **Do you need background information on equipment for industrial safety, hygiene, or maintenance?**

As a service to its readers, "Safety Maintenance" will arrange to supply manufacturers literature on the following subjects. Just insert the key number on the Readers Inquiry Card on the preceding page and be sure to fill in your name and address. If you need information on a specific type of product, simply write it in on the Inquiry Card.

Key Number	Subject
	PERSONAL PROTECTION
101	Safety Goggles
102	Face Shields
103	Lens Cleaning & Anti-Fogging Equipment
104	Sweat Band
106	Respirators & Masks
107	Protective Clothing
108	Women's Protective Clothing
109	Safety Belts
110	Safety Gloves
112	Anti-Slip Soles
113	Oil-Resistant Soles
114	Welding Helmets
	FIRST AID AND HYGIENE
121	Skin Cleansers
122	Sanitary Drinking Facilities
123	Wash-up Facilities
124	Salt Tablets
125	Resuscitator Tubes
126	Antiseptic Medication
127	Burn Medication
128	First Aid Kits & Supplies
129	Stretchers & Litters
130	Throat Medication
131	Eye Wash Fountains
132	Portable Ventilators
133	Dust Collectors
135	Hearing Protectors
	FIRE PROTECTION
139	Fire Retardant Paint
140	Fire Extinguishers
141	Safety Cans
142	Fire Alarms
143	Safer Solvents
144	Degreasing Machines
145	Drum Safety Valve
146	Asbestos Textiles
147	Incinerators
148	Watchmen's Control Systems
149	Fire Blankets

Key Number	Subject
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151	Powered Megaphones
153	Fluorescent Lamp Guards
154	Emergency Lights
	MAINTENANCE
161	Anti-Slip Waxes & Finishes
162	Floor Cleaning Compounds
163	Floor Cleaning Machines
166	Floor Mats
169	Toilet Sanitizers
	LADDERS & HANDLING
170	Ladders
171	Ladder Safety Devices
172	Scaffolds
173	Work Platforms
176	Fork Truck Steering Aid
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	GUARDS
179	Power Press Feeders
180	Safety Tools
181	Vacuum Sheet Lifters
182	Valve Operators
184	Safety Lock-Outs
	EDUCATIONAL AIDS
191	Safety Signs
192	Safety Awards & Emblems
193	Employee Safety Guide
195	Changeable Letter Signs

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Safety Maintenance

formerly "SAFETY ENGINEERING"

Volume 119, Number 4 **April, 1960**

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Cover picture, showing array of telephone batteries that have been under charge, by courtesy of Mine Safety Appliances Co.

AMERICA'S PIONEER INDUSTRIAL SAFETY MAGAZINE

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it's SAFE to say

● THERE'S MANY A SLIP

There must be . . . falls cause more than 18,000 deaths in this country in a single year. Even though most of those falls occur in the home, there are still enough falls in industry to be the second principal cause of all compensable work injuries, exceeded only by "manual handling of objects" in the plants of the nation.

Among reporting states, the average wage compensation paid in all work injury cases was about $700, according to the National Safety Council's "Accident Facts." The most **costly** non-fatal injuries arise out of falls from one level to another. In the states reporting those injuries, they averaged over $1,100 per case just in wage compensation. Allowing for the five-to-one ratio of indirect costs, it will be seen that the combined total direct and indirect cost of such falls averaged over $5,000. Falls on the same level are not much cheaper.

Obviously, one of the factors leading to the high incidence of falls is greater exposure to the hazard of slips and falls. Depending upon the nature of his job, not every industrial employee is exposed to the dangers of toxic fumes, dust or vapors. Nor is every employee required to wear protective clothing or use specifically designed guards for hazardous machinery. But it would be difficult to imagine any job that requires no walking or standing.

Discounting Kid Butter-Soles, who would slip and fall anywhere, all employees can be protected against the commonplace and costly hazard of falls to a far greater degree by the simple installation of safe walkway surfaces which will remove the cause of industry's No. 2 danger.

It is very easy to blame the victim of an eye injury for failure to wear his goggles; we can point out that sheer neglect of a minor scratch or wound often will lead to serious infection; the braggart who wears his respirator dangling around his neck as a decoration is asking for respiratory trouble, and severed fingers may be the machine operator's own fault. But can we expect the employee to provide his own safe walkway surface?

It is in this area that management must bear the sole responsibility for preventing the slipping accident which too often leads to a fatal fall, the cost of which in wage compensation alone averages $11,000.

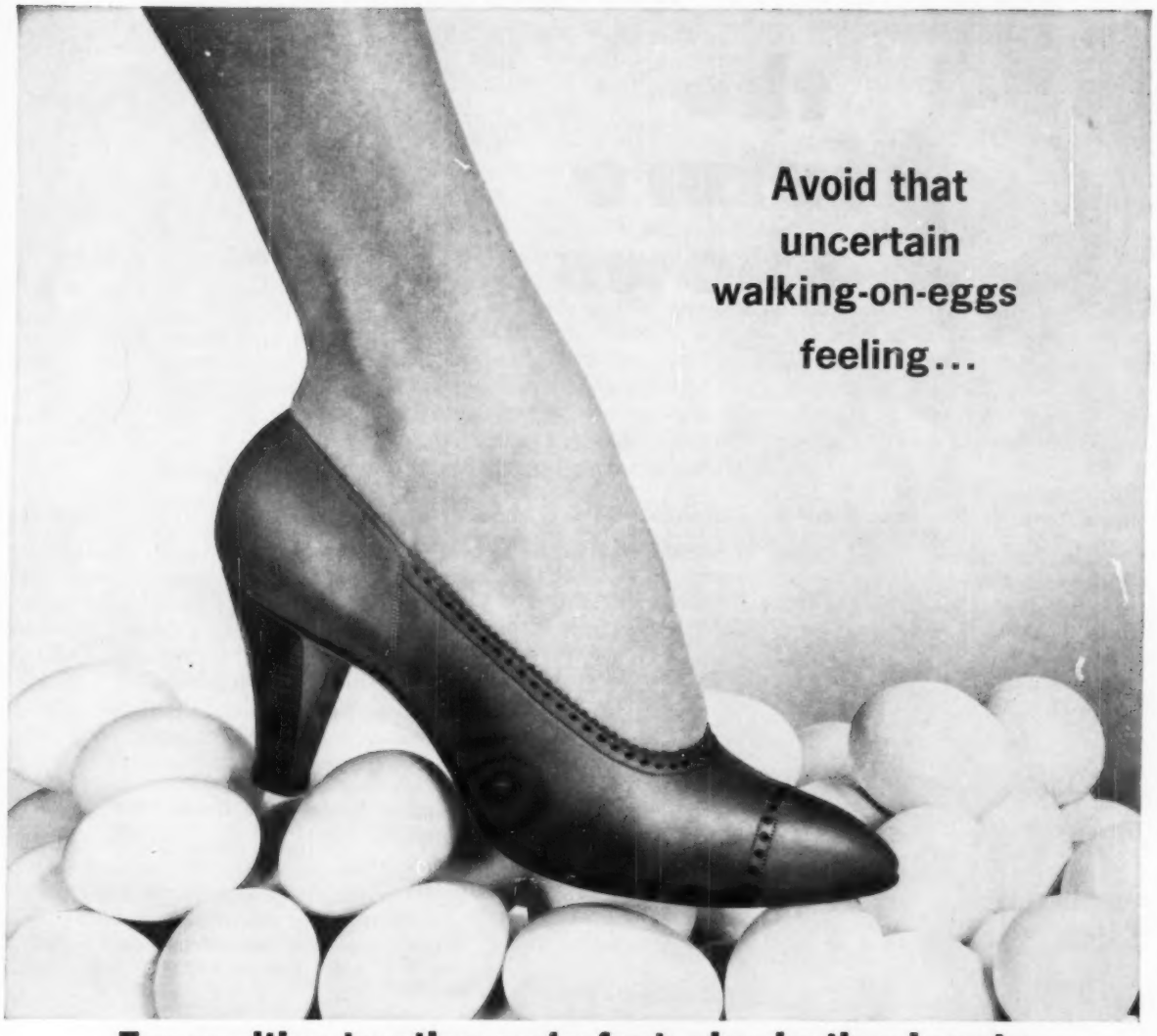
There are many different types of slip-resistant floors, stair treads, ramps and platforms, as well as floor finishes, on the market to cope with this widespread danger confronting the working staff in practically every conceivable industrial plant. Obviously, prevailing conditions and operational use will dictate the class of walkway surface appropriate to do the job of reducing if not eliminating slips and falls. The polished marble floor or highly decorative wax-lustrous floor suitable for a ballroom foyer is never seen in a machine shop, but that machine shop floor can cause more slips and falls in a month than the elegant entrance hall causes in a year. Equally obvious is the fact that the most slip-resistant floor ever installed is no better than its maintenance. Grease spills and slippery puddles, together with cluttered walkways, can become a short-cut to the traction ward.

The National Office of Vital Statistics lists accidental deaths according to the international list of 35 causes of fatalities. This list ranges from motor vehicles to suffocation of infants; from drowning to bites of venomous animals; from explosion to excessive temperatures; from poisoning to lightning. Number Two on this macabre hit parade still shows up as falls.

● SECOND LARGEST SAFETY SHOW

As a welcome relief from a discussion of the country's No. 2 cause of accidental death, there will open shortly after publication of this issue the country's No. 2 safety conference and exposition, scheduled for the week of March 29th in New York City, under the sponsorship of the Greater New York Safety Council working with numerous other public-spirited sponsoring organizations.

The time has come when the Greater New York Safety Conference no longer is designed for delegates living and working in this immediate area. Instead, the appeal of this great safety event has broadened to encompass the entire eastern seaboard of the United States and our near-neighbors to the north and south. Hundreds of subject sessions have been provided by the tireless program committee to emphasize the accomplishments of safety and point up the new hazards coming into view in this atomic era. Once again, the huge exhibit area will provide an expanded display of safety products, devices, equipment and services designed to reduce still further the causes and results of accidental injury. Management in all parts of the country can be kept fully abreast of latest safety developments by assigning a delegate to this convention which is expected to attract upwards of 8,000 visitors.



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With "Ludox" in the floor wax you get added safety underfoot. "Ludox" acts like a brake that promotes easy, effortless walking. And you get the lasting beauty only a fine wax can give your floors. Scratches and scuffs can be buffed out without rewaxing. For more information and a list of suppliers, write us or mail coupon below.

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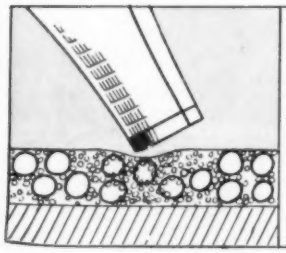

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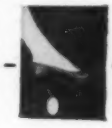

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the future shows

New York, N. Y. *March 28–April 1*

Thirtieth Annual Greater New York Safety Convention and Exposition (Statler Hilton Hotel). William J. Farley, convention secretary, Greater New York Safety Council, Inc., 60 E. 42nd St., New York 17, N. Y.

Los Angeles, Calif. *April 11–13*

Seventh Annual Western Safety Congress and Exhibit (Ambassador Hotel). Greater Los Angeles Safety Council, 3388 W. 8th St., Los Angeles 5, Calif.

Detroit, Mich. *April 12–14*

Thirtieth Annual Michigan Safety Conference and Exhibit (Sheraton-Cadillac Hotel). Ben Duguid, executive secretary, % Allstate Insurance Co., Detroit, Mich.

Buffalo, N. Y. *April 12–14*

Twentieth Western New York Safety Conference and Exhibit (Hotel Statler-Hilton). Clifford H. Seymour, executive secretary, Western New York Safety Conference, Inc., P. O. Box 315, Niagara Falls, N. Y.

Columbus, Ohio *April 19–21*

Thirtieth Annual All-Ohio Safety Congress and Exhibit (Neil House). Arthur W. Moon, congress manager, 400 So. Front St., 3rd Floor, Columbus 15, O.

Cleveland, Ohio *April 25*

Ninth Annual Spring Conference American Institute of Industrial Engineers (Engineering & Scientific Center). C. M. Bednar, Chairman of Promotion & Publicity, c/o Square D Co., 4500 Lee Rd., Cleveland 28, O.

Rochester, N. Y. *April 25–30*

1960 Industrial Health Conference (Rochester Memorial Auditorium). Dr. Matthew E. Fairbanks, Public Relations Chairman, IHC, Kodak Park, Rochester 4, N. Y.

Indianapolis, Ind. *April 27–28*

Thirteenth Central Indiana Safety Conference and Exhibit (Claypool Hotel). Indianapolis Safety Council, 320 N. Meridian St., Indianapolis 11, Ind.

Bethlehem, Pa. *May 2–4*

Thirty-Third Annual Eastern Pennsylvania Safety Conference (Hotel Bethlehem). Harold A. Seward, secretary, Lehigh Valley Safety Council, 602 E. 3rd St., Bethlehem, Pa.

Winston-Salem, N. C. *May 4–6*

Thirtieth Annual North Carolina Statewide Industrial Safety Conference (Robert E. Lee Hotel). H. S. Baucom, Director of Safety, North Carolina Industrial Commission, Raleigh, N. C.

Richmond, Va. *May 5–7*

Virginia Safety Association Conference (John Marshall Hotel). Va. Safety Association, 2501 Monument Ave., Richmond 20, Va.

Seattle, Wash. *May 12*

Fourth Annual Puget Sound Industrial Safety Conference & Exhibit (Olympic Hotel). Seattle-King County Safety Council, 304 Spring St., Seattle 4, Wash.

Duluth, Minn. *May 19–20*

Thirty-Sixth Annual Conference of the Lake Superior Mines Safety Council (Hotel Duluth). Allen D. Look, Secretary, Lake Superior Mines Safety Council, 321 Federal Bldg., Duluth 2, Minn.

Bridgeport, Conn. *June 7*

Fifteenth Annual Statewide Conference of the Connecticut Safety Society (University of Bridgeport). William W. White, Publicity Director, Connecticut Safety Society, 855 Burnsford Ave., Bridgeport, Conn.

Chicago, Ill. *October 17–21*

Forty-Eighth Annual National Safety Congress and Exhibit (Conrad Hilton, Pick-Congress, Sheraton Towers, Morrison, and La Salle Hotels), R. L. Forney, Secretary, National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

Pittsburgh, Pa. *October 26–27*

Twenty-Fifth Annual Meeting of the Industrial Hygiene Foundation (Mellon Institute). Dr. H. H. Schrenk, Managing Director, Industrial Hygiene Foundation, 440 Fifth Ave., Pittsburgh 13, Pa.

Your hearing mechanism is a remarkable device. With it you can detect sounds over wide ranges of intensity, discern pitch, and establish direction . . . but, the ear has failings. It does not permit you to assign accurately and consistently a definite number that relates the intensity of one sound to others. This can only be done with sound-measuring equipment that is free from human characteristics such as emotions, susceptibility to previous noise exposure, and psychological effects. The Sound-Survey Meter (or the more versatile Type 1551-B Sound-Level Meter) provides an accurate means of assigning a value that indicates noise magnitude in terms of a standard reference level. Once sound levels have been given a value, one is well on the way to the control of potential noise hazards and the evaluation of acoustic-treatment procedures.

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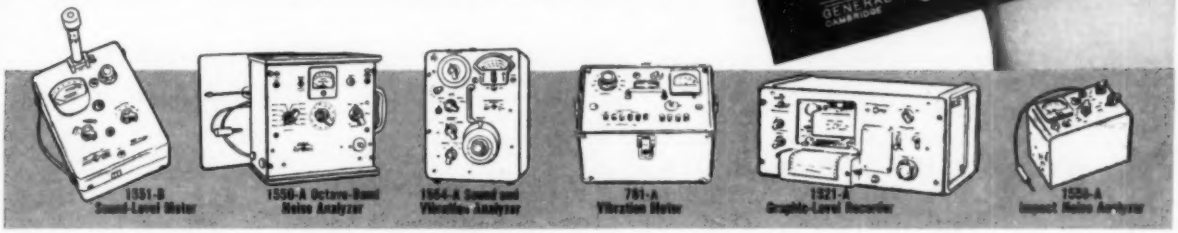

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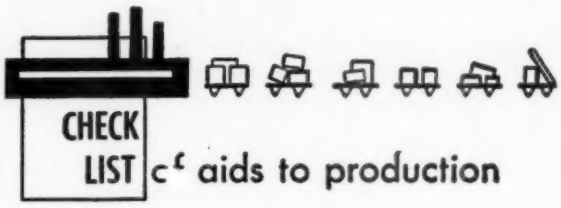

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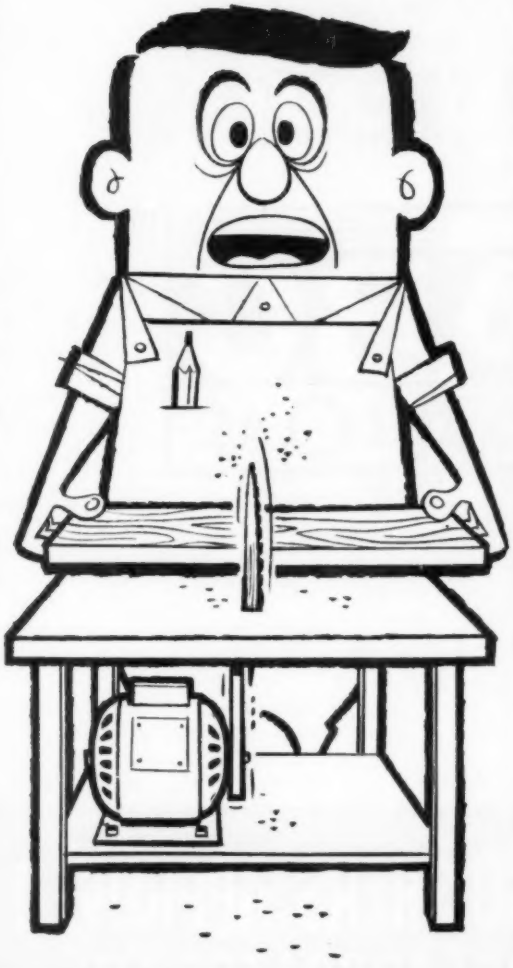

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SAFETY and the MISSILE RACE

by **DAN A. KIMBALL**
President
Aerojet-General Corporation
Azusa, California

Within our lifetime we have seen many new industrial hazards created—electricity, extremes of temperature, high energy materials, poisons, radioactivity, and many others. But at each step of the way engineers, technologists, scientists and safety engineers have also been working to create the necessary counter measures that keep these dangerous giants under control.

In America the disabling work injury rates have steadily declined. Nevertheless, although the improvements in the past have been enormous, as long as one man is killed in industry, our work is not done. Too many people are killed and suffer disabling injuries from industrial accidents. We can't keep up that sort of thing. It's too high a price to pay for progress.

Enlightened management has insisted and will continue to insist on the employee's right to a clean, safe, healthful working environment. Industrial concerns that expect to stay in business must take prompt action to eliminate unsafe conditions, provide effective mechanical safeguards and observe all applicable laws, standards, codes and ordinances as minimum requirements for safety.

We all know that management's attitude toward accident prevention is invariably reflected in the attitude of the supervisory force, which in turn is passed on to the worker. If management is not genuinely interested in preventing accidents, no one else is likely to be. The details for carrying out an accident prevention program may be assigned, but the responsibility for the basic policy cannot be delegated. In our business this is very important and that is why Aerojet's basic safety policy is quite clear and emphatic: **"Safety considerations take pre-eminence over all else."** We have tried to live by this policy to the letter and the results in terms of improved injury records have been most gratifying.

We think we have one of the best safety records in the industry and we intend to keep it that way. We have not only set high standards, but we have hired the best people in the field to administer our safety program for our nearly 24,000 employees and to improve it wherever it falls short.

Old Rules In New Forms

Safety in the rocket industry is nothing more than the application of old fundamentals to new and sometimes strange environments, but that's only half the story. As techniques improve and we keep trying for that last extra pound of thrust, new safety problems emerge and we've got to keep solving them. It's a continuous process and we work at it day and night.

For example, the early manufacturing process involved in making a liquid rocket engine is very similar to operations in making airplane engines. It's largely metal parts—more refined—but generally a machining process. The final product is a big piece of complex plumbing, with one, two, or three nozzles or cones projecting from the bottom. The safety problems are not too complex at this stage. The biggest concern is that it doesn't upset and fall on somebody.

Complicated Dangers

But then this plumber's nightmare is taken to a test stand and connected with a lot more plumbing and such words as "lox," "red fuming nitric," "fluorine," "U.D.M.H.," "hydrazine," "chlorine trifluoride," "nitrogen tetraoxide," and "T.D.I.," just to mention a few, are stenciled on the pipes. Now the once inert plumber's dream has become a nightmare of many colors. All the ingredients of a first class explosive have been brought together to be ignited with the hope of retaining and controlling the reaction that takes place, and at the same time, measuring the energy created to a precise degree of accuracy. These materials are real problems to handle. Some are exceedingly cold, while others are corrosive, and nearly all of them present health hazards.

Then, besides liquid rockets, we have solid rockets and solid propellant motors. In this connection I recall a comment made by an old time explosives man. He said to me: "What's so special about the solid rocket business? We've been turning out Class A explosives for years without any fuss about it." But you can't dismiss solid rocketry as casually as that. There are some

important additional facts to be considered:

(1) Rocket fuels that we are using routinely are a whole lot more energetic than dynamite, TNT, or some of our best gunpowder.

(2) Only a very small change in composition or formulation can turn a smooth burning propellant into a violent explosive.

(3) Hardly any missile propellant formulation can be considered standard. We are changing them from week to week—always trying to release more thrust. So we have a situation entirely different from the explosives industry where the same specifications have been used for years.

(4) The explosives industry rarely casts a stick of dynamite 5 feet in diameter and 12 feet long, whereas this has become routine in the solid missile industry. Not only that, but now we're getting to the point where solid rockets are going to be too big to haul over our highways or by air in one piece and we're experimenting with segmented rockets which you put together at the launching site. These present new safety problems as well as technological problems.

The lessons we've learned from costly accidents which occurred in the industry during the past have brought major safety improvements with far-reaching effects. When things go wrong, the activity stirred up is remarkable to behold. The ingenuity and resourcefulness of safety experts is amazing. Intelligent planning and a respect for the smallest details have been of vital importance. What is now considered standard operating procedure in the missile industry would have been looked upon as an innovation just a few years ago.

Safety From the Start

Today in the missile industry, safety goes into the preliminary planning of designs for construction of buildings, equipment and methods. Safety is built into the process. No new buildings are built, no old ones altered and no process changed without signed approval by the Safety Division. This is accomplished by personal review and sign-off of each drawing or process by a member of the Safety Division qualified to do so. This is a requirement of Aerojet management and probably for the entire missile industry.

A good illustration is our efforts to create new and better solid propellants; the kind with higher specific impulse that everyone is looking for. When a chemist's brainchild formulation for a new propellant is through the lab stages of testing and shows real promise for further development, it becomes the job of our design engineers to develop processing methods and equipment which will turn out, in quantities of one ton or one pound, this same propellant with reproducible physical and ballistic properties. Safety Division personnel must assist at this point in the preparation of procedures so designed that non-technical personnel can perform the necessary manipulations rapidly, with minimum opportunity to err and under conditions of maximum safety. This is no small order.

Remote Control Handling

It is now the general policy throughout the industry that all mixing of live propellant be done remotely. A major concern of our safety engineers is the design and utilization of equipment which can be controlled remotely and operate dependably where dangerous materials are involved. Facilities can be replaced if these blow up, but not human life. As in all industry, employees are recognized as our most valuable asset, so they are afforded the maximum in safety.

Management has learned that while personnel casualties, the destruction of property and loss of production may result from emergencies which sometimes occur regardless of precautions, injuries and damage can be minimized if adequate protective measures are in effect around the clock. The safety of personnel is of paramount importance and transcends all other considerations in every operation performed at Aerojet.

We plan to continue to go the limit to protect our workers. We know the cost and the tragedy of accidents. In the 18 years we've been in business, 14 good, loyal, capable workers have been killed, despite all the precautions we could take. In every case we learned important lessons and took immediate counter measures to make sure our mistakes were not repeated. This takes time, manpower, technical brains, and above all, money. But we think safety is so important that in building our facilities today and making sure they provide maximum protection for our workers, we willingly spend 50 percent more in construction costs than we would have to spend to get the job done without these safety devices.

The greatest enemy of safety at any level is complacence. One form of complacence is unwillingness to spend enough money to achieve the goal of safety on an industry-wide basis. We've got to break that down and improve safety wherever we can. We could make missiles cheaper if we ignored safety, but it is my firm conviction that the American public is not prepared to substitute human lives for dollars.

With all our facilities, with all our resources, the greatest asset of American industry and American life is people. We can't afford to have them hurt and we can't afford to have them killed. Anything we can do to make our safety record better we should do.

From an address presented at the 1960 California Governor's Industrial Safety Conference.

Machinery Maintenance

Current developments in maintenance of machinery and equipment will be the subject of a national engineering conference in St. Louis, Missouri, in April.

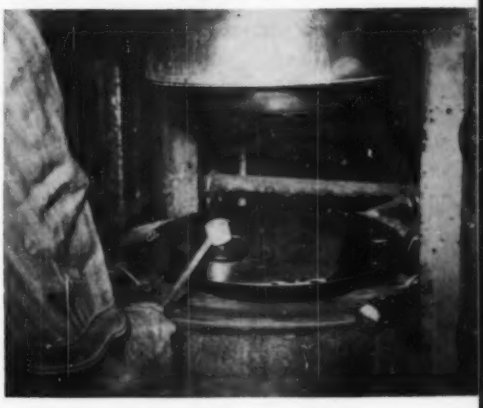
The Maintenance and Plant Engineering Conference of The American Society of Mechanical Engineers, to be held April 25–26, will feature discussions of such topics as: "Are You Getting the Plant You Want—And Paid For?," "Industrial Lighting," "Planning and Scheduling Machinery and Equipment Maintenance" and a forum on specific problems suggested by conference attendees.

ASME President Walker L. Cisler, president also of The Detroit Edison Company, will address attendees of the conference on the opening day of the meetings.

Safety Has Many Facets

Special jobs call for special equipment . . .and for safety, that special equipment takes many forms. The illustrated examples shown here are all from the East Alton, Illinois, plant of the Olin Mathieson Chemical Corporation.

↑
Positive protection for workers handling heavy metal are the metal guards this man wears on his feet. His hands have protection of heavy gloves. The varied equipment shown on this page, if used where needed, greatly cuts injury rate.

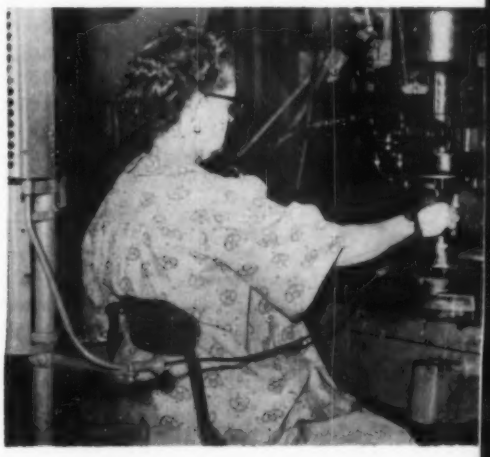


Protection which is adapted to specific job is typified by this suction cup used on the coffee pot line. Such equipment → completely eliminates any necessity for an operator, at whatever point in work, to put his hands in dangerous position.

←
Illustrating proper procedure when pouring acid, this worker is wearing goggles, boots, apron and an acid-proof coverall. Note anti-splash spout on the container. Safety shower is nearby in case of need.

Safety can be built into machines. An example is this Roll-Bond Press being operated under dual controls requiring both hands to activate, making it impossible for the operator to catch his hand. Scrap catchers located at the rear of the press are so built that it is impossible for a person approaching from that direction to get near the press. Another safeguard is the reminder, prominently posted on machine, to wear safety glasses.

Many machines have special equipment installed to increase safety of operation. One is the hand guard used in conjunction with this trim operation. Hand guards are connected to the machine and pull hands back as the machine is being activated.
↓



maintenance of grinding

by **JOSEPH DE FEHER**

The proper care and maintenance of grinding wheels is of importance, equal to that of any other tool in the shop. Wheel life can be considerably prolonged by observing systematic maintenance procedures. These should be supervised by one familiar with the factors which influence the efficient use and care of grinding wheels. Some of these factors are discussed below.

Undue Stresses Shorten Wheel Life

Undue stresses on the wheels are caused by selection of incorrect work speed, wrong surface speed of the wheel and too much infeed or too fast traverse motion. These factors can only be brought into proper balance if the recommendations of the manufacturers of the wheels are followed carefully and the wheel selected has the proper grain, grade, structure and bonding material for the job it is to perform.

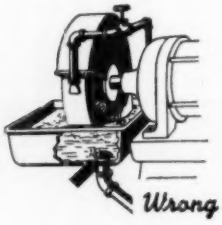


Fig. 1

Grain. The grain of the wheel is the element which does the cutting. The cutting grain is either some natural abrasive such as sandstone, emery, quartz or diamonds, or it may be a manufactured material, such as fused aluminum oxide, corundum, or silicon carbide. Grain sizes are in coarse, medium or fine ranges, meeting certain established standards set by the grinding wheel manufacturers. The selection of the proper abrasive grain depends upon the amount of material to be removed, the finish desired, and the physical properties of the material to be ground. The softer and more ductile the material, the coarser the grain size should be. The coarser grain should be selected also when it is desired to remove more metal or to remove it more rapidly.

Grade. The grade of the wheel indicates the strength with which the abrasive particles in the wheel are held together with the bonding material. It also indicates the measure of resistance offered by the grain particles to the grinding stresses, which tend to tear the grain particles out of the wheel face and wear away the wheel. The bonding materials may be vitrified or silicate products, or the wheels may be resinoid, rubber bonded or shellac bonded.

There are many variations of grade in grinding wheels, ranging from very hard to very soft, and, unless the proper grade is selected, excessive use of wheels will result. In general, a hard grade is recommended for soft materials and a soft grade for hard materials. Also, the smaller the area of contact, the harder the grade should be.

Structure. Structure indicates the relationship of the abrasive grains to the bonding material and the relationship of these two elements to the spaces or voids which separate them. Unless this is properly understood and kept in mind, the wheel selected might be either too dense or too open. As a result, the chips ground off the surface of the workpiece would not be eliminated properly and the grinding would be wasteful. For soft, ductile materials, open structure wheels are recommended, since such structure permits the widely spaced grains to penetrate deeper. For hard materials it is desirable to have as many abrasive particles cutting as possible. Hence, better results and conservation are effected with a wheel of relatively dense structure.

Maintain Proper Surface Speeds

It is generally realized that for every grinding job there is one combination of speed and feed at which each grinding wheel will perform most efficiently. Such a combination is easy to determine when grinding tools. But the slightest variations in the material of the workpiece or in operating conditions make great differences in the finished surface, even though the speed and feed relationships were selected according to standard tables.

Wheels should not be operated above their recommended speed limits, and sufficient supervision should be given to machines and wheels to see that safe operating speeds are not exceeded. Check the spindle to make sure it does not exceed the maximum operating speed shown on the wheel. As a straight wheel wears down and its surface speed decreases, its production capacity also decreases and wheel wear is increased. When the wheel wears down to approximately 75 percent of its original diameter, it should be put on another, faster spindle in order to bring the peripheral speed up to normal. The surface speed, or Surface Feet Per Minute, may be obtained from Revolutions Per Minute by the following formulae:

$$\text{SFPM} = .26 \times \text{dia. in in.} \times \text{RPM}$$

$$\text{or RPM} = \frac{3.8 \times \text{SFPM (approx.)}}{\text{dia. in inches}}$$

It is a mistake to believe that increasing the wheel speed will, of itself, increase production if work

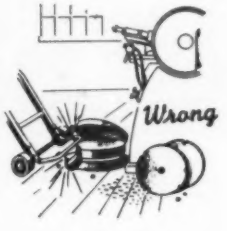


Fig. 2

wheels

speed, traverse, and feed remain unchanged. The grain and bond will be subjected to smaller stresses. The grain will therefore not fracture so soon, but it will be held in the bond longer, become duller before it is torn out, and the wheel will act harder than its rated grade. That is, it will cut more slowly and production will decrease just as though the wheel were originally too hard for the job.

The speeds listed in the ASA Safety Code or shown on the tags

Fig. 3

or blotters supplied by the wheel makers are the maximum speeds that should not be exceeded, **but they are not the recommended speeds for all jobs or under all conditions.** There is no intention on the part of the manufacturer to imply that these speeds are the most efficient operating ones since the speed of a grinding wheel has a direct bearing on its grinding action.

By changing the speed of a wheel the grinding action is changed and with it also the durability and wheel life, rate of stock removal, quality of finish, amount of heat generated, as well as the shape of the wheel.

This is due to the fact that the bonding material (vitrified silicate, shellac, rubber, resinoid or magnesium oxychloride) which holds the grain particles together in the wheel offers a definite resistance against the shearing and compression forces constantly removing grains from the wheel. By varying the speed of the wheel it is possible to change these stresses and thereby cause the wheel to give either a harder or softer grinding action, thus greatly influencing the useful life of the wheel.

Increasing the wheel speed usually tends to produce the grinding action of a "harder" wheel. In cases where increasing the speed is not possible or desirable, a softer wheel will serve. Since softer wheels are weaker, the factor of safety will be lowered very materially. Before making any increase in speed, the user should ascertain, from the latest specification tables, whether the higher speed will provide an adequate factor of safety. One of the basic speed rules in the ASA Safety Code is: "The peripheral speed approved by the wheel manufacturer shall not be exceeded, even though it be lower than the standard speed in the table."

Maintain Wheel Balance

New wheels are reasonably concentric with the arbor hole, but established procedure should be followed in checking wheels for balance and in righting them. Good economy with an unbalanced wheel is impossible. A wheel out of balance hammers the work, leaving long, equally spaced chatter marks in a checkerboard pattern. While, of course, there are other causes for chatter marks, this pattern always comes from a wheel out of balance.

Balance the wheel before and after truing. Balancing before truing eliminates pounding or hammering against the truing tool and prevents uneven wheel face. The more a wheel is out of balance, the bigger the loss in grinding wheel material. Uniform truing can only be done when the wheel is in balance.

When using large wheels, it is advisable to rebalance them at regular intervals. Grinding wheels, as manufactured today, are very uniform in density, a fact which insures, among other things, a good balance. However, a large wheel has an inherent tendency to become slightly out of balance in proportion as wear diminishes its diameter.

Never leave a wheel standing partially immersed in water or coolant, since the wheel will absorb such a liquid and become unbalanced. The picture shown in Figure 1 may be somewhat far-fetched considering present-day equipment; still, with some of the older types of wet grinders this

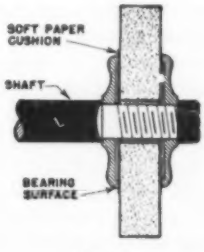


Fig. 4

SAFETY FACTORS IN THE OPERATION OF GRINDING WHEELS

Good care and maintenance of grinding wheels must include consideration of the safety factors in their operation. Impress on the grinder operator the necessity to follow this safty outline:

- **Make sure that the wheel is not cracked.**
- **Inspection should be a continuous, daily habit.**
- **Grinders should never be operated without the proper safety guards.**
- **Make certain that the guards are properly adjusted.**
- **See that sparks will not fly into the aisles or otherwise endanger fellow workers.**
- **Be sure to use safety goggles.**
- **When the grinder does not sound right, shut it off and call the foreman.**
- **Never take a chance with a noisy grinding wheel.**

factor should be carefully considered.

Sharpen the faces of the grinding wheels only with the proper dressing and truing tools, at speeds not higher than operating speeds. Wheels may be dressed either wet or dry, according to whether the grinding is done wet or dry. Select the type of dressing tool recommended by the grinding wheel manufacturers in order to help the grinder avoid excessive heating of the wheel during dressing and to conserve wheel material. If a grinding wheel does not require dressing, it usually is too soft to hold its shape or to produce good finishes. On the other hand, wheels which require continuous dressing are usually too hard and require too many dressing operations, a truly wasteful operation. In either case, wheel life is shortened and conservation of emery wheels is seriously impaired.

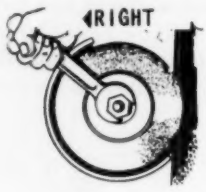


Fig. 5

Fig. 6

Picking Ideal Wheel

Selection of the ideal wheel, that is, a self-sharpening one, is possible if it is picked for a particular production grinding job. However, in a job shop where a wheel can seldom be used on any one job very long, a compromise selection is usually necessary. And no matter how skillful the operator may be in manipulating that wheel between a heavy-cut job and a mirror finish one, the wheel face will have to be dressed. This work should be done only with the type of dressing tool recommended by the grinding wheel manufacturer.

To avoid any excessive amount of metal particles sticking to the faces of the emery wheel, and thus to hold the number of dressings to the minimum, select a wheel with the proper grit size. Only such a selection will provide good chip disposal and maintain desirable conservation in grinding wheels. Chips should fall free of the wheel as they do in dry grinding or be carried away freely as in wet grinding.

Usually, soft, ductile metals tend to create larger chips than hard metals and generally present greater problems of chip disposal, since the large and soft chips tend to stick to the wheel face and require repeated dressing. On the other hand, clean-cut chips from hard metals are more easily disposed of.

Ductile metals demand a more open structure in the wheel to provide good chip disposal, since larger chips with more adequate clearance in the structure decrease the likelihood of metal particles sticking to the wheel face. On the other hand, when grinding hard materials, smaller spaces between the chips are permissible because smaller chips are produced. It may be said in general that the more open the wheel structure, the more chip clearance is provided, the cooler the wheel cuts, and the less is the tendency of the wheel to load, fill up and necessitate repeated dressing of the wheel.

Where coolants are used, they must be kept clean and free of all chips.

Systematic Handling

Guard against wheel breakage by careful handling of wheels upon their arrival, during unpacking and storing. Figure 2 shows the obvious harm that can be done to wheels lying around the shop floor or stacked carelessly against a machine. Check all smaller wheels by suspending each one on a finger and tapping it for healthy sounds with a screwdriver, as shown in Figure 3. If a clear ring is not produced, the wheel should be immediately examined for cracks. Vitrified and silicate wheels sound with a very clear, metallic ring, while organic bonded wheels give a less clear sound. If the wheel is cracked, oil-soaked or water-soaked, it will give an unmistakably dull sound.

The same process should be used when checking a wheel taken from the stock room, to make sure it has not been fractured. Also look for any evidence of a loose or shifted bushing, particularly on wheels which have been re-bushed, making sure that the bushing does not extend beyond the side of the wheel.

See that the wheel slips freely on the spindle without binding. In general, the hole size should be about 0.005 inch larger than the spindle diameter. In case the wheel shows a tendency to bind, the bushing should be very carefully scraped or reamed to allow an easy, sliding fit.

There must be a flange on each side of the wheel, both flanges must be of equal diameter and they must be relieved in the center. Wheel blotters or washers no smaller than the flange diameter and not over 0.025 inch thick must be fitted between the wheel and the flanges. See Figure 4.

Make sure that the flanges bear against the wheel uniformly. The outer flange should have an easy, sliding fit on the spindle so that it can adjust itself slightly and give a uniform bearing on the wheel and the blotter.

Tighten the spindle nut against

(Continued on page 22)

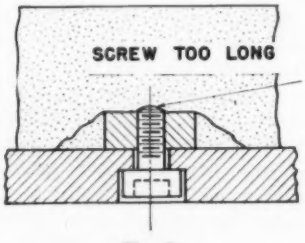


Fig. 7

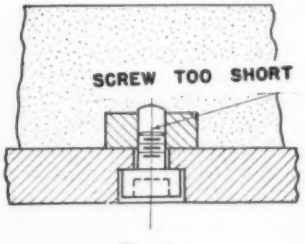


Fig. 8

Make Hazards Spotlight Themselves

One of the most effective methods of preventing accidents, injuries and unnecessary loss has been the use of color to point up both hazardous equipment and the location of safety and fire equipment. Furthermore, the American Standards Association in cooperation with paint manufacturers, color engineers, and safety experts several years ago drew up a Safety Code for the use of color in safety signs, in marking physical hazards, and in the identification of safety equipment, fire equipment and the contents of pipes. Such a code was necessary to make color meaningful from plant to plant and from industry to industry.

The real purpose behind the safety uses of color is of course to make personnel aware of potential dangers and to remind them to exercise caution in their work. The use of the color on the equipment itself, or through signs, acts as a guard between the employee and accidental injury.

A recent development that offers startling possibilities in making color even more effective as a tool of safety is the formulation of daylight fluorescent coatings which have a self-luminescent effect that attracts immediate attention.

In contrast with most regular paints, the daylight fluorescent colors are semi-transparent. As light falls on them, it passes through layers of fluorescent pigment and "bounces back" from the white undercoat. This reflective "bounce back" is multiplied in intensity many times as ultraviolet, violet and blue light is converted to orange, red, yellow and green fluorescent light. This created or transformed light combines with orange, red, yellow and green light already present in the incident light. The total then amounts to appreciably more of the red-yellow colors than was originally present in the light falling on the fluorescent treated object. Furthermore, daylight fluorescent coatings do not give an appearance of white, grey or black at extreme distances as ordinary colors do.

WARNING EQUIPMENT SERIES
other articles May and June

Uses of Fluorescent Colors

Safety directors of insurance companies and industrial firms are unanimous in their recommendation of the use of bright colors in danger areas. Accidents occur most frequently when the mind becomes lulled by long-term repetitive action. Therefore in the operation of production-line machinery, bright, intensely vivid colors are needed to keep the brain alert to dangerous arcing, cutting, spark and stamping hazards.

The luminous vividness of daylight fluorescent paints, when used on these danger areas and on guards, act as constant safety reminders to the operators and other personnel. Industrial safety applications include guards, high voltage wires and connections, switch boxes, exits, steam valves, crane traverses, exhaust fan blades, emergency shut-offs, railroad crossings and rolling stock, safety valves, corner pillars, arc areas, explosive vaults and containers, guy wires, safety helmets, fire extinguishers, first aid stations, signal flags, color coding for pipes, etc.

In addition to the applications on hazardous industrial equipment, high visibility coatings and markings are also very effective in preventing accidents involving materials handling equipment and both in-plant and over-the-road vehicles. These attention arresting colors should be used in painting anti-collision markings on lift-trucks, tailgates, switch engines, plant fire engines and emergency vehicles, aisle markers, "low clearance" warnings, floor hoppers, freight elevators, truck-loading docks, crane hooks, etc.

Types of Paints

The daylight fluorescent paints are made in a variety of formulations for brushing, spraying, dipping, etc. Safety signs silk screened

with special silk screen colors are another important application.

Careful planning of the areas to be coated and proper accenting with dark non-fluorescent colors are necessary for an effective job. Fluorescent areas stand out more vividly when surrounded by dark backgrounds. In some instances where relatively small objects have to be visible at great distances, it is best to coat the whole piece first with the fluorescent colors and let the lettering or design on top of the fluorescence be in a dark, contrasting color.

The fluorescent paints can be used on wood, metals, paper, plaster, glass, plastics and cloth. The primary rule of application is that the colors are brightest when applied over white. Since the white always goes on under the fluorescent coating, surface preparations should concentrate on achieving maximum adhesion of the white to the sub-strate, and then of the fluorescent color to the white. All cleaning and priming procedures usually indicated for the surface to be coated should be followed for the application of the all-important white undercoat. Then after proper drying of the white, the high intensity colors should be applied according to the manufacturer's directions on the label.

While high visibility colors have many applications for trucks and buses, municipal equipment, public utilities, packaging, instrument dials, sporting goods, etc., one rather specialized use has already achieved considerable application —for aircraft and airport use. The fluorescent colors are exceptionally easy to see at dawn, in heavy overcasts, and at dusk, when normal pilot visibility is generally at its lowest. In normal daylight, they attract attention from great distances while regular paints appear to become dull grey and fade into the background. With these high visibility markings on broad areas of the wings, fuselage and tail assembly, even small planes are visible at distances of 12 miles or more. The high visibility safety factor enables approaching aircraft to make visual contact four times faster than with regular colors. Today's fast closing speeds make early recognition an absolute necessity.

Fluorescent colors are widely used at military installations throughout the world. Also, split-second recognition of air markers can frequently be a decisive safety factor in both cross-country flying and while making field approaches. Applications of the special fluorescent paints for aircraft and airport safety include: aircraft markings, airport obstruction markings, missile tracking aids, target and drone markings, runway and boundary markers, hangars, towers, air markers, wind tees, portable ramps, etc.

The aircraft safety paints are specially formulated to perform under the exacting conditions encountered in modern aviation. Actually, they should be referred to as "systems" rather than paints since the requirements for surface preparation, priming, white-undercoating, application of fluorescence, and the final clear overcoating are all governed by a strict set of rules worked out by long experimentation.

In addition to industrial safety paints, aircraft safety paints, screen process colors, aerosol spray cans, brushing colors, and water colors, daylight fluorescent materials are also available in pressure-sensitive tape form. The tapes work best on smooth surfaces such as glass, metal (bare or painted), painted wood, tile, painted concrete, plastics, etc. No surface preparation is needed other than cleaning and drying. Tapes are particularly suitable for highway maintenance vehicles, trucks, buses, directional arrows, industrial safety, signs, etc.

Material and picture by courtesy of Lawter Chemical Co.

Recommendations for Fluorescent Safety Paints

As applied to Safety Color Code for Marking Physical Hazards and the Identification of Certain Equipment Z53.1—1953, ASA.

APPLICATION	Red-Orange	Yellow-Orange	Red	Pink	Cerise Red	Gold Yellow	Lemon Yellow	Green	Purple (Special color)
Fire protection apparatus, walls and supports for which extinguishers are mounted. Flammable liquid containers, barricades, danger signs, emergency stops on machines, emergency stop buttons for electrical switches.	●		●	●	●				
Top and bottom treads of stairways, low beams and pipes, crane hooks, tractors and industrial locomotives (in stripes with black).		●				●			
First-aid and safety equipment, stretchers, gas masks and bulletin boards.							●	●	
Dangerous parts of machinery or energized equipment, elevator doors or where gear, belt or other guards around moving equipment are open or removed.		●				●			
Radiation hazards. Yellow should be used with purple for tags, labels, signs and floor markers.		●				●			●

As applied to Safety Color Code for Accident Prevention Signs Z35.1—1941, ASA.

APPLICATION	Red-Orange	Yellow-Orange	Red	Pink	Cerise Red	Gold Yellow	Lemon Yellow	Green	Purple (Special color)
Warning of special dangers (signs for high-voltage, toxic and corrosive chemicals, collision hazards and explosives.)	●		●	●	●				
Caution; possible dangers or unsafe practices (signs for elevators, aisles, danger areas on machines, no-smoking, safety goggles, etc.)		●				●	●		
Safety instructions (signs for directions to first aid stations, etc. and general information.)								●	
Arrows at exits and stairways.				●					
Radiation signs (directions to shelters).									●

As applied to Identification of the Contents of Pipes A13, 1—1956, ASA.

APPLICATION	Red-Orange	Yellow-Orange	Red	Pink	Cerise Red	Gold Yellow	Lemon Yellow	Green
Fire Protection	●		●		●			
Dangerous Materials		●				●	●	
Safe Materials								●
Protective Materials				●				

NO ACID INJURIES HERE

Use of acid resistant clothing is making possible safer and more economical handling of large quantities of acid at C & D Batteries, Inc. of Conshohocken, Pa. This protective clothing is made available by the company to employees at its Conshohocken and Attica, Indiana, plants.

C & D Batteries, Inc. is a major producer of industrial type lead acid batteries used in the materials handling, communications, railroad and public utility fields.

Louis M. Eble, Jr., Vice President in Charge of Purchasing for C & D, says the firm handled over three million gallons of battery acid during a period of over 500,000 man hours without a disabling accident.

Equipped with respirator, a supplement to large exhaust system, worker takes drum from tank to mix oxides and lead.

Much of the credit for this excellent safety mark is attributed to use of protective clothing and equipment during acid handling operations. Employees and management have achieved this high standard of safety by recognizing the existence of the hazard and using protective devices such as the acid-resistant clothing, respirators, goggles, safety gloves, etc.

C & D standardized on the use of special clothing at both plants because of the fabric's high resistance to acids, wear, moths, mildew, shrinkage, snagging, and tearing. The protective clothing is fabricated of Dynel and its service life qualities are in the fabric—not added in a treating process.

Changing currents for lead calcium batteries are adjusted. Operator's clothing is acid resistant, which cuts costly deterioration where acid use is heavy.

At one of plant's acid-filling stations employee is wearing clothing resistant to chemicals, protective gloves & goggles.

"Aside from the safety angle in our acid handling operation," says Mr. Eble, "the shirts, trousers, and overalls greatly reduce costly clothing deterioration. Ordinary cotton work clothes are destroyed in just a few days by the normal exposure to acid experienced in many of our operations."

This special clothing which is not affected by acids has a service life of more than one year when used by employees in constant contact with acids. And, according to Mr. Eble, supervisory personnel at C & D plants are able to use the same clothing for more than two years.

However, this acid-resistant clothing is just one of the many safety measures planned to provide maximum employee protection at the company's two plants.

Some of the other equipment includes respirators and electrostatic air samplers. The respirators are lightweight face masks which provide protection from potentially dangerous dusts and mists. At C & D, employees who mix oxides with lead dusts for batteries use these filter respirators as a precautionary supplement to an extensive exhaust system. This system is

(Continued on page 22)

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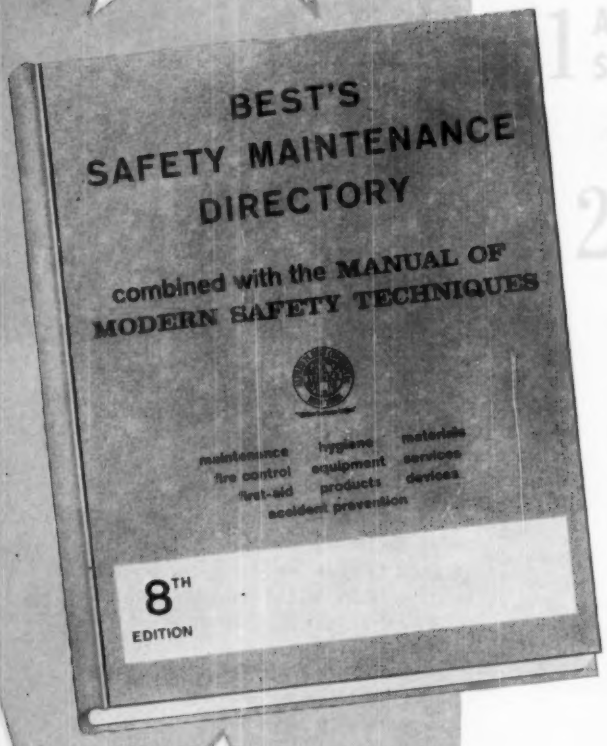

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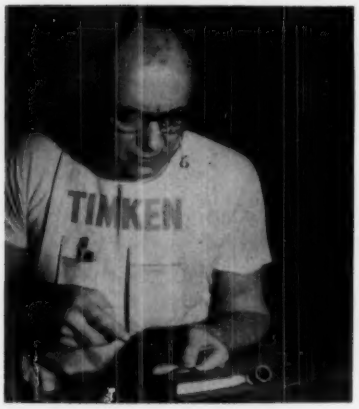
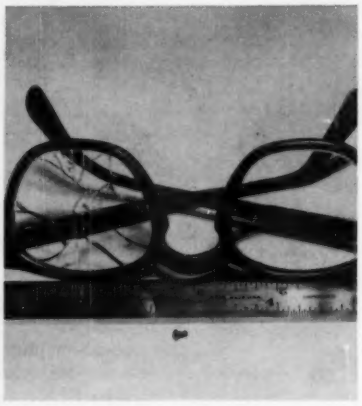




Eye Endangered By Simple Operation

Joseph DeDent, development specialist at The Timken Roller Bearing Company's Production Development Division, was doing a simple repair job when the left lens of his safety glasses was shattered. It was an accident that didn't seem possible, but as safety experts know these are the kind that take their toll every year.

Joe was prying loose a small identification plate, $1\frac{1}{4}'' \times 1\frac{5}{8}''$ in size, from a limit switch housing with a screwdriver. The switch was securely fastened in a bench vice. Four small-drive screws held the plate in place. One of the drive screws which weighs only .003 of an ounce, suddenly released, flew upward 15 inches and hit the center of the lens with great impact. Joe was not injured, nor did any foreign body become lodged in his eye. Joe is sure he would have lost the sight of that eye had he not been wearing safety glasses.

The prescription safety glasses Joe was wearing were furnished at no cost by the company. It's a service offered to all employees of the Timken Company to encourage the use of safety glasses. Broken glasses are replaced at no charge as well.

Wheel Maintenance
(from page 16)

the flange enough to hold the wheel firmly, with only a moderate pressure on the nut, as shown in Figure 5. Otherwise excessive strains may be set up in the wheel, as shown in Figure 6. An abrasive wheel will not "give" and excessive strain may crack it.

When mounting flat steel disc wheels, it is important that the abrasive disk be perfectly flat in order to provide proper bearing; otherwise the disk may be warped and stresses be produced in the wheel, creating dangerous conditions. Be sure the end of the screw does not pull out the inserted nut or fracture the abrasive disk, as shown in Figure 7. On the other hand, if the screw is too short, as shown in Figure 8, it will not have sufficient holding power.

Grinding faults which imperil good care and maintenance, may be traceable, however, to other conditions like poor foundation of the grinding machine, grinding spindle bearing too loose, defective power transmission due to poor belt lacing, damaging belt slippage, improper alignment of the grinding machine, and similar improper conditions.

Avoid Overloading the Wheels

Do not make the costly mistake of constantly overloading a wheel. A margin of safety is built into every wheel to absorb accidental or emergency overloads, but constant abuse will soon cause serious and expensive damage. Check against any tendency to overload by seeing to it that the shopmen are operating the grinding machines according to the manufacturers' instructions.

Grinders should never be operated without the proper safety guards.

Some of the foregoing general points on good care and maintenance, together with others not mentioned but of equal importance, are incorporated in the various bulletins issued by the Grinding Wheel Institute, 2130 Keith Bldg., Cleveland, Ohio, and in the numerous free pamphlets and reprints of articles published by all well-known and reliable grinding wheel manufacturers.

Pictures and material by courtesy of Small Business Administration.

No Acid Injuries
(from page 19)

checked periodically with electrostatic air samplers, instruments which take a quantitative sample of air-borne dust, fumes, and smoke by electrical precipitation. These instruments are high-efficiency collectors of solid materials in atmosphere. Through these periodic samplings of the plant's air, workers can be protected against malfunction of the filter and exhaust system.

"This clothing and equipment, as well as other safety materials, are part of a continuous program designed to give our employees the ultimate in safe working conditions," Mr. Eble states.

C & D batteries are used in heavy duty trucks, diesels, and control apparatus, as well as use in many marine and rail applications.

Pictures by courtesy of Mine Safety Appliances Co.

Work Injuries In Brick & Block Industry

This report contains a detailed analysis of the frequency, severity, and kinds of injuries experienced in the concrete brick and block industry. Included in the report are analyses of:

1. Injury rates by—a. Establishment size, b. Geographic areas and States, c. Occupation;

2. Nature of injuries and parts of body affected.

This report may be obtained free of charge by directing your request to the Bureau of Labor Statistics, U. S. Department of Labor, Washington 25, D. C.

BLAST CLEANING MACHINE SPEEDS PARTS MAINTENANCE

When businessmen talk about inflation these days one of their most likely subjects is the high cost of man-hours. While some people just talk about it, Toronto transit Commission's vehicle repair shop did something. They changed their system of cleaning bus wheels.

Now they get a better job with fewer man-hours. Cutting man-hours saves them money. There only regret is in not switching to the new method a lot sooner.

Result: better cleaning, plus a speed-up which changes a full-time job for three men into a part-time job for one man.

Operator loads three bus wheels into table-room, closes door, pushes starting button. Everything else is automatic.

At their vehicle repair shop, where all maintenance and repair work is performed on Toronto Transit Commission and Gray Coach inter-city busses, this matter of cleaning bus wheels is almost a never-ending job. Toronto is a big city. It takes a lot of busses to serve the nearly one and a half million population of this area. Most bus wheels are 20 to 22 inches in diameter and weigh about 80 pounds. Periodically the paint, trust and scale must be removed from the shoulders where the lock ring holds the tire to the wheel. This is done as a safety precaution to make sure the lock ring seats properly so it won't come out. Of course, the appearance of the wheel is important, too—a rust free surface looks better, lasts longer, holds a better paint job.

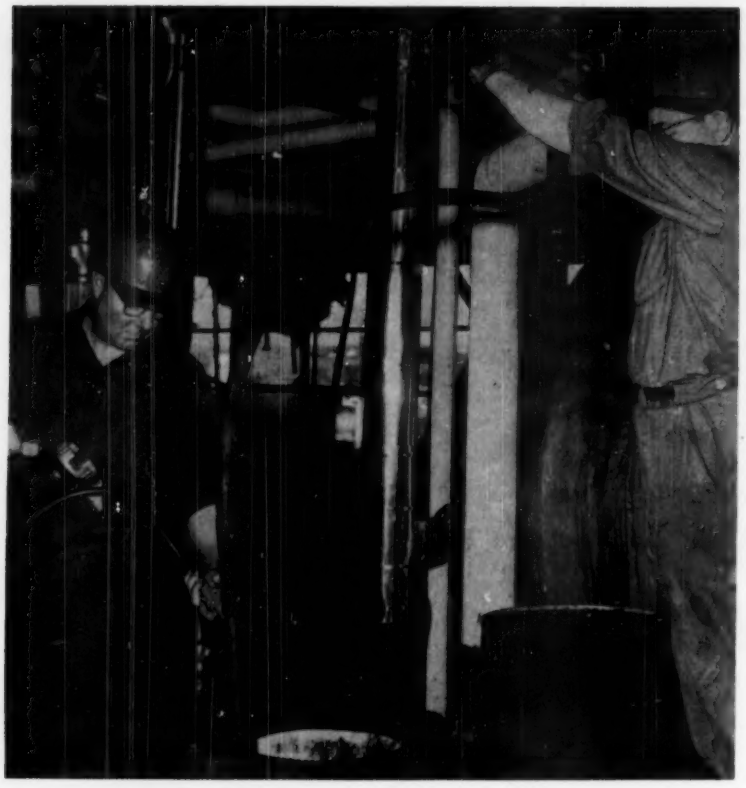
Previously this work was accomplished by hand scraping and wire brushing. Cleaning was perfunctory, ineffective—and it took at least

Before and after—perfect cleaning provides a positive safety factor. Speed of method quickly saved cost of equipment.

35 minutes per wheel even at that. Everything considered, the over-all cleaning rate was probably one wheel per man-hour.

Then Toronto Transit Commission installed a relatively small (4' dia. work table) blast cleaning table-room. Now one man cleans three wheels far better than before in six to eight minutes' time. Considering handling time, production

A SAFETY IDEA



Fire Protection In Chemical Operation

Draining a still pot in a chemical company is a potentially hazardous operation. An operator stands ready to use dry chemical fire extinguisher in case of emergency. Notice hard hats and safety glasses on men.

Picture by courtesy of Ansul Chemical Co.

probably averages eighteen wheels per man-hour.

Since daily requirements average slightly more than twenty wheels (some days it goes as high as forty or fifty) the new equipment has therefore changed a full-time job for three men into a part-time job for one man—at considerable savings.

To suit its particular needs TTC picked equipment that is a versatile, all-purpose machine designed specifically for companies with a wide range of cleaning problems where production does not warrant the purchase of multiple machines. Its operation is simplified by partial automation; after loading, operator closes door and pushes the starting button. Everything else is completely automatic—it starts, abrasive flows, cleaning takes place for a preset cycle after which the machine shuts off the wheel and the abrasive, and awaits unloading by the operator—who in the meantime has been doing other work without worrying about getting back to the machine in time to shut it off.

Bus wheels are cleaned three at a time on the 48" dia. rotating work-table. One airless, centrifugal abrasive-throwing unit with 10 hp motor throws 15,000 lbs. of abrasive per hour.

TTC reports the blast cleaning equipment efficient and economical to operate. After 360 wheel hours, no vane changes have been necessary. There has been no significant wear or replacement of parts. The machine has proved economical on abrasive—a combination of shot and grit (S-230 and G-40) is used. A highly efficient abrasive cleaning system screens out coarse refuse, removes fines by controlled velocity airwash and adjustable skimmer plate, and recycles good abrasive to the wheel to be used over and over again. The equipment features a cast labyrinth abrasive sealing system which makes the cabinet fully abrasive-tight and dust-tight; TTC boasts one of the cleanest machines in the cleanest locations of any similar operation. Blast cleaning is conducted immediately adjacent to other repair and maintenance activities.

Pictures by courtesy of Pangborn Corp.

Safety Is Efficiency

Accident prevention and health figure large in top management policy at the Chino Mines Division of the Kennecott Copper Corp., a leading copper producer which recently celebrated its 50th anniversary. This emphasis is reflected throughout the organization and accounts for the cooperative attitudes of supervisors and other employees toward the safety program.

This was the theme of a report given to the Mining and Exploration Division of the Society of Mining Engineers of AIME by Chino's Safety Director, Paul L. Hunter. The Society is a constituent part of the American Institute of Mining, Metallurgical and Petroleum Engineers, and is the professional organization for engineers and geologists in the mineral industries.

The Chino operation consists of an open pit mine at Santa Rita, New Mexico, and a reduction plant, including mill, power plant, refinery and smelter, at Hurley, New

Mexico. Almost 2,000 employees mine and treat 66,000 tons of copper ore and other materials every day. Safety and industrial health programs at Chino were reorganized in 1955.

"We stress that safety is efficiency," said Mr. Hunter. "This is the basic principle from which our program starts."

Mr. Hunter's paper stated that savings in compensation costs alone in the 1955–1958 period, over the preceding 10-year period, were probably $60,000 a year as a result of the accident prevention program. "This estimate does not include medical expenses, damaged equipment, loss of production, or overtime replacement costs," he said. "Consideration of all factors involved in accident costs indicate that savings to the division amounted to as much as $250,000."

Chino has developed pre-employment physical standards "which assured us of the best physical abilities from our existing labor markets," said Mr. Hunter. "The job placement program was enlarged to allow the employment of a limited number of handicapped persons from the labor market, thus helping us fulfill our moral obligation to society."

Conn. Safety Meeting

The 15th annual statewide conference of the Connecticut Safety Society will be held June 7 at the University of Bridgeport, Bridgeport, Conn. Approximately 300 industrial safety directors and other safety officials are expected to attend the one-day conference, according to Kenneth L. Stebbins, Society President, and Safety Director of Avco's Lycoming Division.

Nine panel discussions are scheduled to take place during the day on numerous aspects of industrial safety. Among the topics to be discussed during the morning session are: "Helpful Safety Services Which Are Available to All Without Cost," "Safety and Preventive Maintenance Department," and the new "Connecticut Fire Safety Code."

At the afternoon session the discussion topics will be: "Material Handling and Transportation Inside the Plant and on the Road," "What Should a Personnel Director Do to Assure His Safety Program Will Be a Success," and "Is Good Safety Performance Costly."

Panel discussions scheduled for the evening are as follows: "What Should You Include in Your Safety Program," "What Should Management and Staff Do to Assure a Successful Safety Program," and "How to Get Your People to Work Safely."

Serving as panel chairmen during the various panel discussion sessions will be: Paul V. O'Reilly, The Employers Group; Henry M. Bradley, Manning, Maxwell and Moore, Inc.; Alan J. Craig, The American Cyanamid Company; John P. Turner, Shelby Mutual Casualty Company; Henry Bialoglowy, Connecticut State Labor Department; Donald H. Ackley, The G. & O. Manufacturing Company; R. C. Murtagh, Liberty Mutual Insurance Company; Charles A. Wooding, Wallingford Steel Co., and L. J. McCarty, Remington Arms Co.

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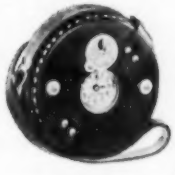

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INHALATION OF GASES—Pre-Existing Tubercular Condition

An employee's tubercular condition was found not to be connected with his employment of converting appliances for use with natural gas, even though he inhaled quantities of natural and manufactured gases. The employer contended that his condition was the result of an infection, and that there was a gradual deterioration of his physical condition over a period of time. Tuberculosis is known to be caused by tubercular bacilli, and the employee did not have any exposure in his work to such germs beyond that which any individual would normally have in his daily life. It was shown that there was no eventful happening constituting an accident; his condition could not be justly found to be accidental in nature. The aggravation of a condition not occupational in nature is not an occupational disease. Therefore, the compensation board erred allowing compensation. Reversed.

Goldberg vs. Conversions & Surveys, Inc.; New York Supreme Court. Appellate Division, 3rd Judicial Department. No. 848. December 10th, 1958.

TUBERCULOSIS—Failure of Employer to Warn Employee of Symptoms

An employee was allowed compensation for the aggravation of tuberculosis allegedly caused by the employer's negligent failure to warn him of incipient symptoms disclosed by x-rays taken at the employer's plant hospital. The employee's claim was based upon a nonfeasance, the negligent failure to warn, not the tuberculosis, which concededly, was not traceable to his position. The aggravation, in the course of employment, of a nonoccupational disease, has been held to be compensable under the act. The failure to inspect the x-ray plates carefully and to promptly warn the plaintiff sufficiently located "the accidental injury" as to the time and place where the accident occurred, or in the alternative, that the continuing failure to warn constituted repetitive acts incident to the employment for which compensation was available. Affirmed.

Tourville vs. United Aircraft Corporation; United States Court of Appeals, Second Circuit. No. 25162. January 6th, 1959. Appeal from the United States District Court, District of Connecticut.

ARISING OUT OF AND IN THE COURSE OF EMPLOYMENT—Employer's Premises

The lower court erred in holding that the claimant, a housekeeper in an infirmary, who was given room, board, laundry and paid $75 per month, sustained an injury arising out of and in the course of her employment. While going to the dining hall for supper, she fell down stairs of the dormitory and broke her hip. The claimant's working hours were 7:00 a.m. to 3:00 p.m. except Monday and every third Sunday when she was off duty. The claimant's injury occurred on Sunday, the claimant's day off. The court held that the claimant's injuries were not compensable. The claimant's work included waxing floors and cleaning window blinds, baseboards, and kitchen equipment. None of these duties were performed in the dormitory at which she resided and where she received her injury. The claimant was simply going down stairs on her way to supper when she fell. The fall sustained by her was not contributed to by any factor incident to, or in any way connected with, her employment. Reversed and remanded with directions.

Masonic Widows and Orphans Home v. Lewis; Kentucky Court of Appeals. December 11, 1959.

STRAIN AND EXERTION—Causal Connection Between Shoveling Coal and Death

The deceased employee, a night watchman on a floating derrick was found dead on Monday morning shortly after greeting the first worker. The evidence showed that it was customary to let the derrick's boiler fire die out on Friday night during the summer and to rekindle it on Monday morning. It took 150 to 200 pounds of coal to get steam up and the boiler was generating steam when the first worker went on board that morning. A water pump weighing about 80 pounds was found on a scow alongside the derrick. The court affirmed the board's finding that immediately prior to his death the decedent shoveled coal and moved the heavy pump. Two physicians testified that the unusual and heavy exertion

which the decedent performed prior to his death precipitated his fatal heart failure. The court held that the decedent's death resulted from the unusual strain and exertion of his work activities. Affirmed.

Oaksman vs. Henry Quist Construction Co.; New York Supreme Court, Appellate Division, Third Judicial Department. No. 1547. December 10th, 1959.

EXPOSURE TO COAL DUST—Anthracosilicosis—Causal Connection

A state compensation board improperly granted death benefits to a widow. The board found that her husband's death was due to exposure to harmful dust for a period of 60 days while employed as a fireman for a college. The board referred the case to three chest specialists who found the disease was due to decedent's work in and about Pennsylvania hard coal mines and that exposure to coal dust in the employment in issue here was not of sufficient duration or severity to contribute to the disabling disease of extensive anthracosilicosis of the lungs. Other physicians also concurred with this opinion. Reversed and claim dismissed.

Gorsky vs. City of New York; New York Supreme Court, Appellate Division, Third Judicial Department. No. 862. December 2nd, 1958.

A.S.A. Meeting

The Company Member Conference of the American Standards Association will hold its Spring Meeting at the Sheraton Hotel, Philadelphia, May 2–3, under the chairmanship of D. F. Hollingsworth, principal standards engineering department, E. I. du Pont de Nemours & Company, Inc., Wilmington, Delaware.

Concerned mainly with standards problems of individual companies, the Conference will discuss the following subjects–

New Developments in Precision Measurement; speaker, Alvin G. McNish, acting chief, division of optics and metrology, National Bureau of Standards.

Motivations For Reducing Item Varieties; a session presided over

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...until you've matched specific pieces of safety equipment you are now using against their Safe-Hi counterparts — test by test. I challenge you to do this! If your present equipment holds up, safety-wise where Safe-Hi equipment fails, I will pay you double the purchase price of your equipment. If your present equipment fails where Safe-Hi Equipment holds up, you are under no obligation — save your moral obligation to equip your men with the *best* safety equipment available.

To arrange for such tests*— at our expense — write to me direct. Take me up on this challenge! You risk nothing — yet you may save employees' lives. Write me today!

Clarence W. Rose MA

Member — American Society of Safety Engineers. Veterans of Safety

*These tests to be conducted under agreed prearranged conditions and under your control.

The Case of the Ladder that

reached the roof...wrecked the roofer!

Just as the worker neared the roof's edge, the base of his ladder slipped — taking the worker for a one-way trip to hard cement below. His smashed ribs and twisted knee, caused by slippery, wet cement, could have been avoided — if the ladder had been equipped with safe *shoes!*

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hold on dry or wet floors, giving engineered protection to the man on the ladder. Neoprene fibre-impregnated tread, listed by UL for all surfaces, has the advantage of Neoprene for dry floors and fabric on wet floors. A self-sharpening spike for use on snow or ice is instantly available and may be flipped in place by hand or foot. Tread ridges *across* the line of slippage, scrape off oil or dirt and increase traction — for the save-ability important to anyone who mounts a ladder! SAFE-HI Safety Equipment *is* safe — just as safe as continuing research and a lifetime of experience can make it. Complete information on Safe-Hi Ladder Shoes, Lanyards, Shock Absorbers, Belts... yours FREE. Just write for catalog.

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(For details, use Key # Q-8 on card on page 1)

by R. J. Abele, chief standards engineer, Burroughs Corporation. This session will deal primarily with the factors necessary to simplify and improve inventory controls and purchasing procedures.

What the Standards Engineer Should Know about Safety and Fire Prevention; a presentation by Edgar J. Meyers, assistant manager, safety and fire protection division, E. I. du Pont de Nemours & Company, Inc. Mr. Meyers' paper will concern itself with the role of the standards engineer in plant safety programs and providing standards for safety equipment.

Industry's Stake In Military Drafting Practice; a forum of military and civilian experts, presided over by C. M. Wright, staff engineer, engineering division, Chrysler Corporation. The military viewpoint regarding the new Military Drafting Requirement MIL-D-70327 will be presented by C. L. Miller, Armed Forces Supply Support Center and James H. Mars, Bureau of Naval Weapons. C. E. Hilton, secretary of graphic standards board, American Standards Association, will explore the possible methods of military and industry cooperation in drafting practices.

Problems of Company Standards Engineer; a forum moderated by P. J. Callan, director of material standards, Eastman Kodak Company.

It is expected that some 25 member companies will have standards exhibits at the conference. The purpose of these exhibits will be to illustrate the use of standards manuals and the methods of standards development and application within a company.

Plant tours are also included on the agenda for the conference delegates. Among the installations to be visited are, the Philadelphia Mint, Franklin Institute, du Pont Paint Plant, du Pont Paint Laboratory.

The American Standards Association is the national clearinghouse for standardization in the United States. It is a federation of 122 national trade associations, technical and professional societies and consumer groups. More than 2,000 firms are affiliated with ASA as company members.

The Company Member Conference is open to non-members as well as members of ASA. Information regarding this conference may be obtained by writing to Henry G. Lamb, Secretary, Company Member Conference, American Standards Association, 10 East 40th Street, New York 16, N. Y.

Work Injuries Rose Last Year

Job injuries experienced during 1959 disabled 1,970,000 American workers, according to preliminary estimates of the U. S. Department of Labor's Bureau of Labor Statistics. Approximately 13,800 of these injuries resulted in death.

The 1959 injury total, the highest since 1953, was 8 percent above the 1958 figure. Though increased employment contributed to this rise, there was also an increase in the injury rate—up from 29.4 per thousand workers in 1958 to 31.2 in 1959. The 1959 rate was about the same as in 1954 and 1956 but was below other earlier years and 32 percent below the wartime peak rate of 45.7 in 1943.

Fatal injuries did not increase as much as did work injuries in general. The 1959 total of 13,800 deaths was 4 percent above the 1958 figure but was lower than any other year on record. The death rate of 22 per 100,000 workers matched the record low established in 1958.

Compared Favorably

Although the 1959 injury record was not as good as 1958, it compared favorably with that for most recent years. The upswing appears to reflect increased industrial activity, since the injury rate often rises when there is an influx of new workers and experienced workers are shifted to new processes and activities.

In addition to the 13,800 deaths, approximately 84,200 injuries resulted in some degree of perma-

(Continued on page 50)

To handle those hot, tough jobs nothing equals Surety Silvertex Gloves for longer wear and lower cost. Superior Silvertex coating reflects heat and affords better protection against most industrial chemicals than rubber and standard synthetics. Their curved finger design and wing thumb construction cuts wear and gives greater comfort. And they won't crack or peel—remaining soft and pliable for the life of the glove.

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THE SURETY RUBBER COMPANY
CARROLLTON, OHIO
In Canada: Safety Supply Co., Toronto

(For details, use Key # Q-9 on card on page 1)

THE FIRE FRONT

Fire Training School

Advanced techniques in fire-fighting will be taught this summer at the test station of Ansul Chemical Company, Marinette, Wisconsin. Twelve sessions of the company's fire school have been scheduled from May 16 to September 26.

Employees of Ansul customers are eligible to attend the school without charge except for living expenses. Each session will last 2½ days. During this time, trainees will be instructed in the use of hand, wheeled and large-capacity Ansul equipment. Most of the school will be taken up with actual fire-fighting practice. Group discussions and training films will round out the curriculum.

Ansul fire equipment users who want to send representatives to one of the Fire School sessions should contact the Ansul regional office in their area. Regional offices are located in Paoli, Pennsylvania; Milwaukee, Wisconsin; Cleveland, Ohio; Kansas City, Missouri; and Burlingame, California.

Starting dates for the twelve sessions of Ansul's Fire School are: May 16, May 23, June 6, June 13, June 27, July 18, Aug. 1, Aug. 8, Aug. 22, Sept. 12, Sept. 19, Sept. 26.

Fire Award Winners

Louisville, Kentucky, and Vancouver, British Columbia, have been named grand award winners in the National Fire Protection Association's annual Fire Prevention Contest for 1959.

The awards, for which more than 1500 entrants from the United States and Canada competed, are based on year-round efforts to reduce fires and to educate people in fire safety.

The contest is sponsored by the National Fire Protection Association, a 17,000-member, non-profit, educational and engineering organization devoted to improving the protection of life and property from fire. The Association's membership is drawn principally from U. S. and Canadian business and industry, fire departments, and governmental officials throughout North America.

January Losses Drop

Estimated fire losses in the United States during January amounted to $92,949,000 the National Board of Fire Underwriters has reported. This $92,949,000 loss represents a decrease of 17.7 percent from losses of $112,983,000 reported for January 1959, and a decrease of 3.6 percent from losses of $96,444,000 for last December. These estimated losses include an allowance for uninsured and unreported losses.

There were six additional grand award winners in other divisions of the contest, which has been sponsored annually for 33 years by the National Fire Protection Association.

Industry—Montreal Transportation Commission, Montreal, Quebec; **Government**—United States Post Office, Chicago, Illinois; **U.S. Army**—Fort Sam Houston, Texas; **U.S. Navy**—United States Naval Station, Norfolk, Virginia; **U.S. Air Force**—Myrtle Beach Air Force Base, South Carolina; and **Department of National Defense, Canada**—RCAF Station, Falconbridge, Ontario.

A total of 1541 entries was received in the 1959 contest: 744 in the Municipal division; 458 in the Military division; 125 in the Industrial division; 205 in the Government division; and 9 special entries. The purpose of the contest is to stimulate universal fire safety consciousness and to encourage broader use of modern techniques in both public and private fire prevention education.

Aviation Fire Program

Fire, aviation's most dreaded enemy, is to undergo searching examination and hoped-for elimination under a new USAF program supported by Major General Joseph D. Caldara, USAF Deputy Inspector General for Safety. Meeting with representatives of the National Fire Protection Association, General Caldara announced inauguration of the first phase of the NFPA's "Operation: Aviation Fire Research" by establishing an Air Force Working Group composed of safety and fire protection experts and research specialists. This group will investigate the long range objectives and research needs of the USAF in this field.

The second phase calls for the NFPA to monitor a joint military-civil attack on aviation fire hazards in flight, at time of crash and on the ground.

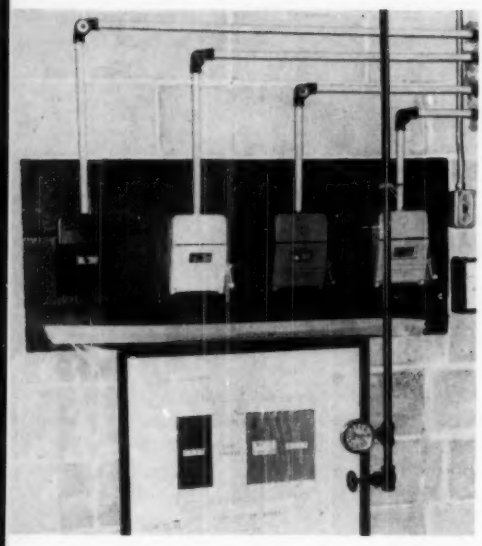
Jerome Lederer, Managing Director of the Flight Safety Foundation and Harvey L. Hansberry, Assistant to the President, Flight Safety, Fenwal, Inc., as Chairman and Vice Chairman of the NFPA's Aviation Committee's Executive Division, will spearhead the stepped-up program to reduce the staggering fire losses being experienced in this field. In 1958 alone, the total dollar cost was over $143,000,000, according to NFPA estimates.

Fire—The Killer

Fires in this country killed almost 950 people a month during 1959, the National Fire Protection Association reported.

About 30 percent of the casualties were children. More than half of all the deaths occurred in home fires.

(Continued on page 32)



Besides being fully automatic, the foam-water system can be triggered manually to act before flammable liquid ignites.

Simple clean-up operations are effected after foam-water test by flushing foam down drain pipes with streams of water.

Air Foam

The theory of "equivalent isolation" in fire protection was recently applied by installation of an air-foam sprinkler fire fighting system in a commercial airline hangar.

Definition of the term "equivalent isolation"—a solution for fire protection where large volumes of flammable liquids are used or processed—was given recently by Edgar B. Rumble, manager of "Automatic" Sprinkler Corp. of America's new product development division. "It is the ability, through means of special fire protection methods, to establish, in effect, isolation of equipment and processes from spilled flammable liquid fire hazards which, by the very nature of these equipments and processes, cannot otherwise be removed before they are damaged," said Rumble.

"This mechanical foam-water system may be compared in its application to a candle snuffer. By covering the candle the oxygen feeding the flame is cut-off immediately and the flame can no longer survive. Our foam-water blanket performs the same duty."

Theory At Work

In a recent six-minute acceptance test in Canadian Pacific Airlines' 36,000-square-foot Vancouver hangar, 450 of the system's 600 foam-water sprinkler heads were used to discharge 220,000 gallons of air-foam, covering the whole area with a six-inch-thick blanket of foam which remained until washed away with fire hoses.

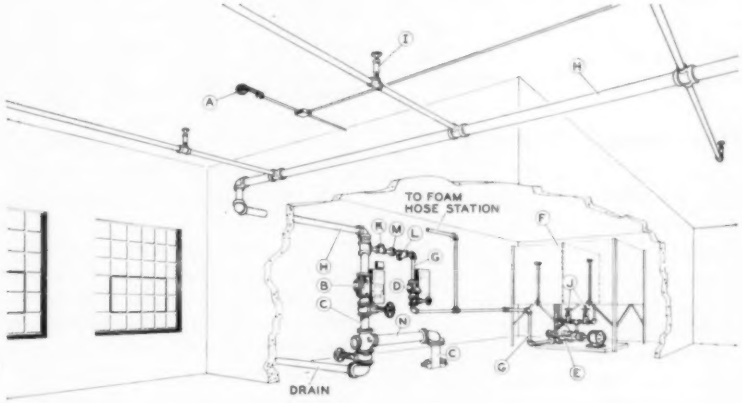
Though not mandatory for minimum building protection under standards set by the National Fire Protection Association, the air-foam installation was made because the hangar often contains as many as three Bristol Britannias, worth $3.5 million, carrying up to 16,000 gallons of fuel each.

Canadian Pacific officials pointed out that when a gasoline or turbine fuel fire breaks out in a hangar, air foam is a most effective extinguishing agent. It is in such cases that the "equivalent isolation" theory is put to use. Foam floats on and smothers burning fuel, whereas burning fuel would float on water, thereby endangering the plane. Since it is virtually impossible to remove the $3.5 million aircraft in time to prevent costly damage or total loss, the air foam method is employed to isolate the equipment from the flammable liquid fire hazard. An additional, and highly important advantage, is that the foam flows under wings and fuselages where conventional water sprays cannot reach.

For fire prevention in case of fuel spillage, the system can be activated manually to blanket the endangered area with foam in 30 to 60 seconds, reducing the chance that it will ignite. The foam blanket will protect against ignition until the fuel is carried away by ordinary floor drains.

Engineers point out that, while the cost of an air-foam protection system is somewhat higher than that of a standard sprinkler system, total costs of fire protection including special drainage and other construction features have been substantially reduced by installation of an air-foam sprinkler system.

Special drainage in hangars,



A-HEAT RESPONSIVE DEVICE
B-DELUGE VALVE
C-WATER SUPPLY LINE
D-COMPANION DELUGE VALVE
E-FOAM LIQUID PUMP
F-FOAM LIQUID STORAGE TANK
G-FOAM LIQUID SUPPLY LINE
H-FOAM SOLUTION LINE
I-FOAM-WATER SPRINKLER
J-O.S.&Y. GATE VALVES (NORMALLY OPEN)
K-CHECK VALVE
L-SEDIMENT STRAINER
M-ORIFICE PLATE
N-SELF-FLUSHING STRAINER

OPERATING EQUIPMENT FOR TYPICAL AIR FOAM SPRINKLER SYSTEM
FOAM SOLUTION PROPORTIONING BY FOAM LIQUID INJECTION PUMP

A snow storm? No! Foam weather conditions prevail inside the hanger of Canadian Pacific Air Lines as acceptance test is run on the foam-water protection system that has been installed in this hazardous area.

Isolates Fire

chemical manufacturing areas, paint and varnish mixing areas, and other non-aircraft hazardous areas, is often considered necessary—when air-foam sprinklers are not used—to quickly carry away spilled flammables and water discharge.

Several similar non-aircraft installations have been made in the chemical, petro-chemical, utility, and general manufacturing industries where similar hazards occur. In one such installation, because of drainage installation savings, a reduction of more than 30 percent in over-all cost was realized, in addition to obtaining the special advantages of air-foam sprinklers.

Operation of System

In the Canadian Pacific Airlines installation, the system is designed to deluge the main hangar area with air-foam discharging at a rate of up to 60,000 gallons of expanded foam per minute, and to follow with a standard sprinkler discharge when the foam supply is exhausted. After a fire, the foam is flushed down drains with hoses, or if left, it will eventually dry to a powder which can be swept up easily.

Air-foam deluge begins automatically whenever the system's heat-actuated devices detect an abnormally rapid rise in temperature. Normal rates of temperature rise, caused by weather changes or operation of the heating system, are ignored by the detection devices. No external power is required for fire detection, since the detection devices are actuated—virtually instantaneously—by energy produced by fire.

The detection units used in these installations are hollow metal air chambers, with no moving parts, connected via metal tubing to a diaphragm-operated valve release mechanism. As heat expands air in the units, pressure builds up and is transmitted to the diaphragm. At the diaphragm is a compensating vent which permits air flow in and out at a limited rate to relieve ordinary pressure fluctuations.

However, when air in the detection system expands rapidly, due to a sudden temperature rise resulting from a fire, the vent cannot release pressure quickly enough. This pressure moves the diaphragm far enough to trip a lever-and-weight mechanism, which in turn actuates the fire protection control valve.

Canadian Pacific's foam-water system is divided into four separate and individually operating systems, each with its own detection devices, release mechanism, and main valve. The installation includes two 300,-000-gallon-capacity water tanks and four pumps. The pumps start automatically whenever water supply main pressure drops.

Supervisory pressure in the mains is provided by small electric jockey pumps. Water from the pump house to the sprinkler system is distributed through a 12-inch, 4,000-feet-long underground loop main, which surrounds Canadian Pacific's main headquarters property. A 16-inch connection is extended from this main to the valve header in the hangar.

Pictures by courtesy of "Automatic" Sprinkler Corp. of America.

Walls of water- and foam make up the fire protection set-up, which consists of four systems using ground level deflectors on perimiter of wings and fusilages.

Fire—The Killer

(from page 29)

Property lost to fire cost in excess of $100 million monthly.

According to preliminary estimates by the international fire safety organization, the United States slightly improved its fire death record last year. Total fatalities were 11,300, approximately 200 less than the figure for 1958.

Including the 1959 loss, however, means that fire has taken an estimated 116,000 lives in this country during the past 10 years, the National Fire Protection Association pointed out.

The 1959 U. S. property loss total, an estimated $1,275,000,000, was also under the previous year's figure. The decline was approximately $3,800,000.

Included in the 1959 total are $1,055,000,000 worth of buildings and contents destroyed by fire. The balance of $220,000,000 covers aircraft, motor vehicle, forest and other nonbuilding fires. Corresponding figures for 1958 were $1,056,308,000 and $222,500,000.

The worst loss of life fire in the U. S. during 1959 occurred in Meldrim, Georgia on June 28. Fire and explosion of LP-Gas following a freight train wreck killed 23 adults and children picnicking in a nearby recreational area on the Ogeechee River.

Almost as many died when fire struck a state-operated boys' industrial school at Wrightsville, Ark. on March 5. Of the 68 boys locked in the dormitory for the night, 21 could not escape.

Worst Property Disaster

In terms of property loss, the country's worst disaster took place in Roseburg, Ore., on August 7, when fire touched off explosives in an unattended parked truck. The explosion and fires which followed destroyed more than $10,000,000 worth of property and killed 13 persons.

The second largest, according to National Fire Protection Association records, was the Pentagon fire of July 2. Available estimates indicate the damage cost $6,690,000.

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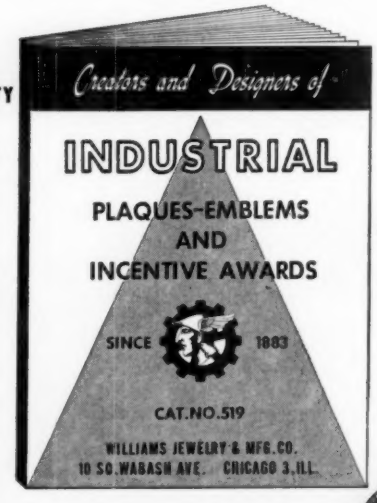

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Radioactive Material Fires

A few of the actual accidents with radioactive materials which have concerned fire departments have been described in a bulletin issued by the National Board of Fire Underwriters. As might be anticipated, because of the specialized emergency service available from fire departments, not all of these incidents with radioactive materials involved fires. Other bulletins discuss hazards of radioactivity as they apply to fire departments and precautions to take with materials.

These incidents emphasize the need for firemen to learn something about the control of radiation hazards. Because radioactive materials may be found in transit through towns where they normally would not be used, no fire department should consider itself completely immune to the possibility of a radiation accident. Those in towns where radioisotopes are used should take special care to see that their members are adequately trained.

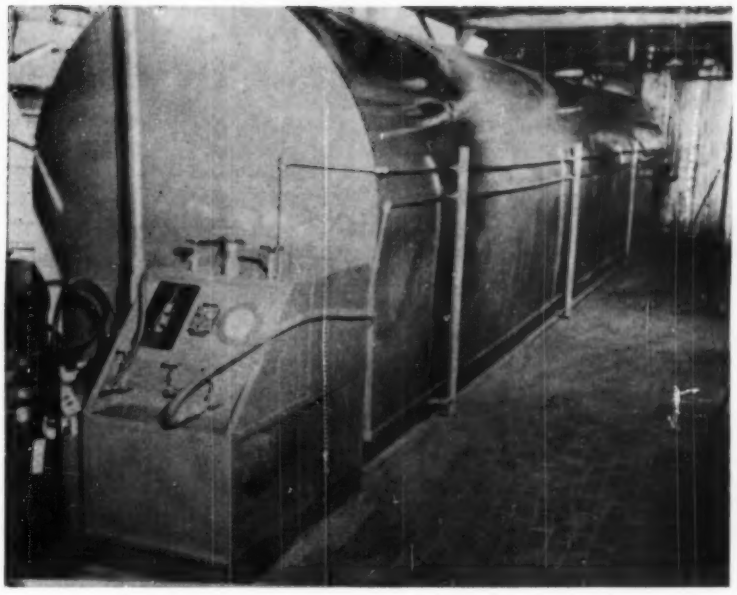
(1) Firemen responded to a laboratory in a large city and quickly extinguished a fire which did several thousand dollars worth of damage to the building. Only after the fire was out did firemen learn that a source of gamma radiation was present under the debris. Fortunately the radiation shielding around the material was not destroyed by fire and no radiation injuries to the firemen resulted.

(2) A tractor and tank trailer carrying over 1500 gallons of a radioactive uranium compound overturned on a hill because of defective brakes. The solution spilled onto the road, which was immediately closed to traffic. The fire department was called to flush the material off the road into a ditch where the saturated dirt was dug up and removed for subsequent reclaiming of the uranium. A large percentage of the uranium was removed and the radiation level was reduced to a point where no controls were necessary on the road, which was re-opened four hours after the accident.

(3) Firemen were called to a rail-

(Continued on page 51)

In foreground is unit of this twelve and one-half ton storage tank for recharging plant carbon dioxide hand extinguishers.



CARBON DIOXIDE SYSTEM PLUS . . .

Automatic carbon dioxide extinguishing systems that totally flood protected areas are an excellent means of controlling many difficult fire hazards, but their use also requires precautionary training for employees.

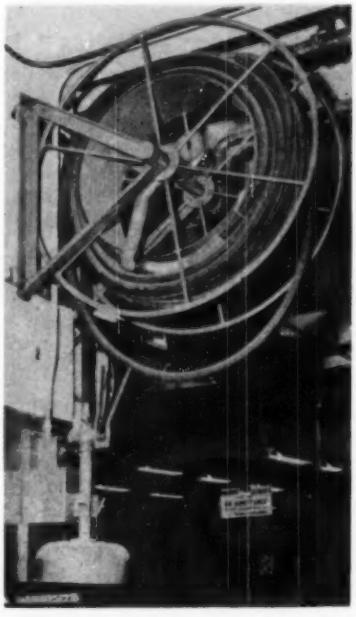
by **GLEN R. ALDRICH**
Safety Director
Hamilton Division
Bendix Aviation Corp.
Hamilton, Ohio

Carbon dioxide is employed as the fire extinguishing medium for many areas in our plant. In discharging carbon dioxide on burning materials, air temperatures are as low as minus 110 degrees F. The smothering effect of carbon dioxide, plus this low temperature, cools the burning material or substance below the ignition temperature and thus fire ceases to exist.

The carbon dioxide supply for all hazards is contained in a twelve and one-half ton storage tank. The master control valves for all hazards are located at the supply tank, as is the electric control panel. Wires to the various pieces of equipment are brought together in the control panel. It is here that the operations of sounding alarms, shutting down of plant machinery, and the opening of the solenoid valves are controlled.

Each of the hazards is individually controlled through either automatic or manual, or, both automatic and manual switches which, when operated, close the circuit to the particular hazard relay for the hazard operated. The hazard relay then closes several switches which do such operations as closing the alarm relay, starting the time cycle controller, and closing the circuit to the proper solenoid valves. It has a self-holding circuit operating through a switch on the timer which holds closed until the time switch opens. The alarm relay in turn energizes the alarm bell and breaks the power supply circuit to the actuating devices in the hazard. The alarm relay is held energized until the power to the holding circuit is shut off by pushing the reset button. The switches on the time cycle controller operate in sequence to break the power supply to actuating devices on other hazards operating from the same timer—to open the solenoid valves after a pre-discharge alarm period where such alarm period is required —to close the solenoid valves after allowing the proper discharge time —and to break the holding circuit on the hazard relay. When the solenoid valve opens, pressure in the piping causes operation of a pressure operated switch which in turn shuts down the appropriate plant electrical equipment.

Simultaneously, with the breaking of the power supply to actuating devices in other hazards, a power source is connected directly to the timer motor. This circuit causes the timer to continue running after the hazard relay has opened and up to the set position



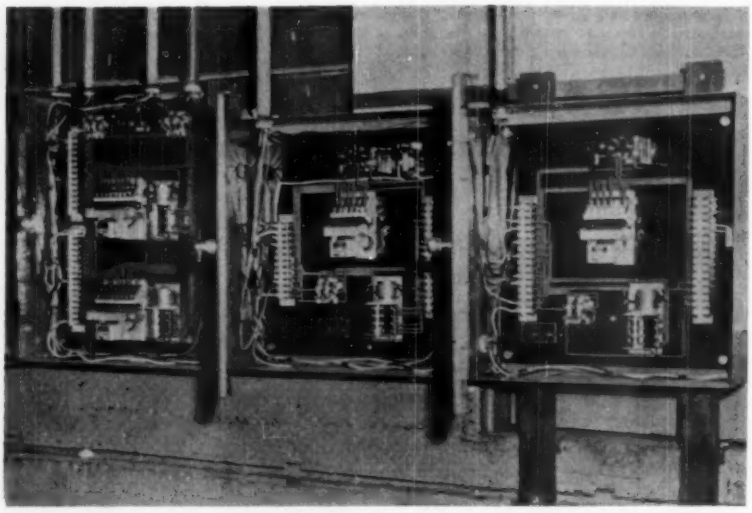
Important feature of hose reel in above picture is the manual control at nozzle.

of the timer. At the set position, power is restored to the actuating devices in other hazards and the direct supply to the timer motor is disconnected, stopping the timer. The alarm continues to sound, electric power to the hazard remains shut down, and the power supply to the actuating devices in the hazard operated remains disconnected until the system is reset.

Supervision and Employee Education

All supervisors and employees working in the carbon dioxide protected areas are given information and instructions about the fire extinguishing system. Cards with the following information are issued to each employee in the areas:

1. Carbon dioxide is harmless to the human body. However, if breathed in large quantities it can cause suffocation. The effect of breathing air containing a high percentage of carbon dioxide is the same as in drowning. Likewise, the treatment of a person for carbon dioxide suffocation is the same as for drowning.



Pctured above is an electric control panel. This is where operations of sounding alarms, shutting down machinery, and opening of solenoid valves are controlled.

2. Because of the above fact, all persons must vacate the area before the carbon dioxide is discharged into the area.

3. Plenty of time is allowed in the automatic delay mechanism for everyone to vacate the area. No one should try to rush out.

4. Persons should leave by predetermined routes and should move entirely away from the area where the alarm sounds.

5. When the alarm sounds and the power shuts off you know that carbon dioxide is about to be discharged and all employees are to leave the area, immediately.

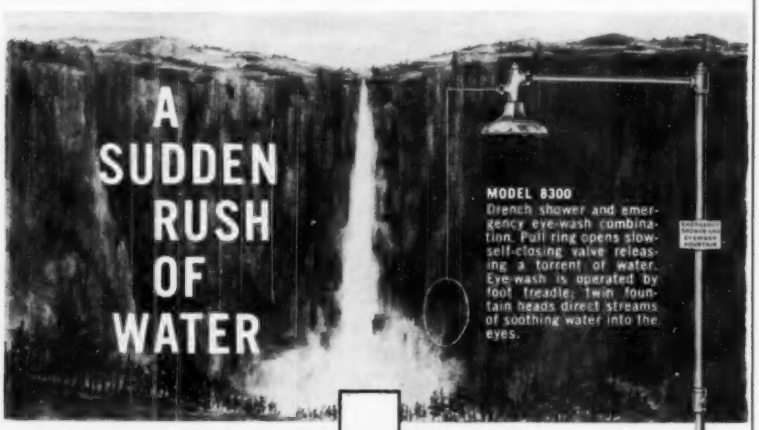
6. There can be no mistaking the carbon dioxide discharge as it is accompanied by an intense hissing noise. Discharge of liquid carbon dioxide, due to its very cold temperature, appears as a very dense, white fog. Small quantities of this gas can be breathed with no ill effects. It has a very pungent effect in the nostrils even though it is odorless.

7. You should be firmly impressed with the importance of vacating the area in an orderly manner. Let nothing interfere with an orderly exit.

8. Employees must not remain in the area to attempt to help a fellow-worker in case of an accident. The Plant Protection Department is equipped to do rescue work in the areas, using special equipment provided for that purpose, handled by men trained in its use.

9. When the alarm sounds and the power shuts off, leave the area immediately. Don't rush. Leave in an orderly manner. Don't scream or make unnecessary noise. Don't return for clothing or lunches. Keep cool—work fast—get out of the area

(Continued on page 40)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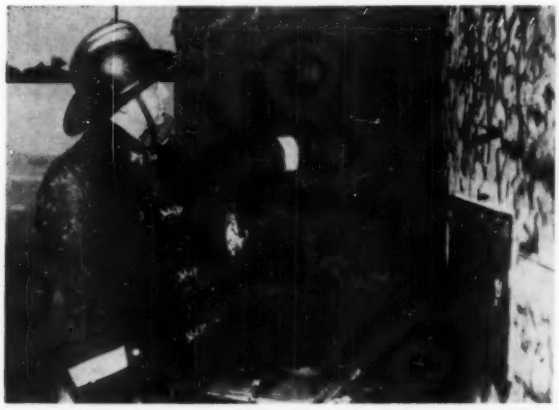

Fireman points to a one-inch thick insulating mat created by fire-retardant paint, which halted spread of fire during test.

NEW DEVELOPMENTS IN FIRE-RETARDANT PAINTS

by **DR. LEROY W. SHUGER**
Vice President
Baltimore Paint and Chemical Corp.

We in the chemical and application engineering segments of the paint industry have long been working toward the time when paint could be entitled to full recognition as an essential primary weapon in fire protection and fire prevention. After many years of intensive—and costly—study, research and tests these comparatively young graduates in the paint family are now ready, willing and able to be employed.

Before looking ahead into the broad and effective contributions these new fire retardant paints can make to the over-all field of fire protection, let's briefly examine the record leading up to their present stage of development.

World War II set off an era of technological advances that has been staggering in its magnitude and the results of which are in full bloom today. Fortunately for mankind, saving life was also the goal of much of our war-time research.

Perfected in War Time

A war-time program, for example, perfected practical methods of making fabrics non-flammable. The Quartermaster Corps applied flame retardant finishes to tentage duck. Similar programs for flameproofing of fabrics were in progress in other service laboratories. The Army Corps of Engineers at the Engineer Board, Fort Belvoir, Virginia, developed methods for treating camouflage netting. The Navy's Industrial Test Laboratory investigated flameproofing of life jackets. The Chemical Warfare Service Development Laboratory investigated suitable methods for the flameproofing of summer flying suits. During the North African campaign it became apparent that fire resistant finishes should be available for general use on clothing fabrics. The results of these war-time fabric flameproofing research projects have since been made available to the general public.

Non-Combustible Paints

During these same war years there was similar research with paints. The holocaust of Pearl Harbor caused the United States Navy to re-examine carefully the behavior of ship paints when subjected to fire. Many of the bulkheads of ships moored at Pearl Harbor had as many as twenty coats of paint. It was a Navy practice at that time not to scrape off old paint but to paint over existing films. When a bomb was dropped into a compartment of a ship, it was not possible to confine the fire to that compartment. When the bulkhead became blazing hot, the thickly painted film sloughed off, the paint gave off gases, these gases ignited, and the heat and the flame traveled through the compartment to the next bulkhead and then on to the next compartment. This caused a chain reaction type of fire with complete disaster in an unexpected short time.

It thus became a top priority job to develop a non-combustible paint to avoid such re-occurences. The Navy, aided by the Paint Industry, developed a start toward fire retardant paint and as its basic fire fighting ingredients used antimony oxide and chlorinated paraffin. Such a product adequately served the purpose intended. Although often referred to as a "fire retardant" paint, such a composition is more accurately defined as "non-combustible." This early paint was effective because it was applied to bulkheads made of steel. Since the paint did not burn and the steel itself was non-combustible, the over-all result was satisfactory. However, this type of paint, when subjected to fire did not produce any insulating layer. Therefore it would not prevent the ignition of the surface on which it is painted from burning if that surface is combustible. Paints of this nature are still made and while they serve no fire fighting function, they at least do not add their own components to the fuels of an existing fire.

Fire-Retardant Forerunner

These non-combustible paints were the first of what we now call "fire retardant paints." In short, the paint industry had produced a product which was non-combustible but not yet completely worthy of the name "fire retardant." What was needed was a paint which would be suitable for use on wood and other cellulosic materials—it would not only be non-combustible of itself, but would retard propa-

gation of heat and flame and thereby protect such surfaces. A type of paint known as an "intumescent coating" efficiently fulfills this requirement. Such paints are commercially available today and according to recognized independent testing laboratories provide excellent fire protection.

Intumescent Paints

Very simply, an "intumescent" fire retardant paint is one which, when exposed to heat of fire, expands and forms a thick, honeycomb-textured wall of insulation against heat transmission. Thus, in case of fire, an intumescent fire retardant paint actually acts to protect the surface under it against heat of fire. Furthermore, the chemical reaction to fire, which we call intumescence, stops flame spread at the point of contact with the paint. The chemical action under fire is immediate and automatic. The energies of fire are absorbed in the creation of this honeycomb-textured or spongelike layer. No new component materials are miraculously formed during this process of intumescence. The paint itself decomposes when attacked by fire and changes to a semi-liquid composition containing gases that puff out the paint to form a fire-fighting layer of insulation. And when the fire is over, this puffy layer is easily scraped away—leaving the surface ready for repainting.

By the same token, the paint does not leap off the wall or other surfaces and go looking for fire to put out. The fire retardant paint acts to insulate and stop flame spread only when it is actually attacked by fire. On the other hand, it will most definitely contain a fire within a painted area for varying lengths of time, will protect the surface under it and will control smoke developed by the fire.

In the past some of the criticism against such a product has been that the gas forming ingredients are water soluble—the paint film is water sensitive and on aging will be affected by moisture in the air and the fire retardancy consequently lessened. However, this objection has now been overcome.

The problem is also complicated for the paint formulator by the need that a fire retardant paint retain the inherent qualities of a good paint, i.e., ease of application, good decorative appearance, washability and suitable durability. Today there are painting systems that will provide all the properties indicated.

For years the Paint Industry has concentrated on developing a coating—maybe only five-thousandths of an inch thick—that could keep fire at bay long enough so that the fire source would burn itself out, or at least long enough so that human life could be saved. Its research has been successful.

Today, the largest users of fire retardant paint are the military, federal and municipal governments. In these cases, the word "user" may be slightly less appropriate than the word "specifier." By this I mean, that a building owner uses fire retardant paint because it has been specified in the building code of his area. Likewise, many schools and other public institutions become users through safety specifications that govern their operation. And in the same manner, many, many branches of the military are more and more incorporating fire retardant paint specifications into their codes of maintenance and construction.

U.L. Classifications

With fire retardant paints, as with fire fighting equipment, the Underwriters' Laboratories is the leading recognized testing agency. The meaning of the flame spread classifications as listed by Underwriters' Laboratories may require explanation. The apparatus for the test is a 25 foot long by 20 inches wide standard tunnel at the base of which is an intense flame controlled for uniformity by one of the operators of the test. Travel of flame along the painted surface is encouraged by a strong draft. Untreated red oak wood is arbitrarily classified as having a flame spread of 100. This means that the flame has traveled along the entire 25 foot length of the test section. Faster burning building materials have flame spread classifications far in excess of 100.

The non-combustible standard is

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SPECIALLY DESIGNED FOR TODAY'S HIGH-SPEEDS
Illustrated at top of ad is Type NXA-7 with huge 8" lens and transistorized circuit for new high in significant light output. Above, NXA-360 for 360° coverage.
ENTIRELY NEW DESIGNS
Built to give the most light for the least money . . . initially and over the years. Cuts bulb replacement, battery changes, and servicing down to new lows . . . brings warning impact and performance to new highs!
TWO COMPLETE LINES
Choose the best types for your specific needs . . . unique transistorized neon-lamp units for highest power or economy types to withstand rugged use and abuse. One-way, two-way, and 360° coverage types . . . automatic and radio controls available.
SEND FOR COMPLETE SPECIFICATION SHEET
dealer and rental agency inquiries invited
CARPENTER MFG. COMPANY
650 Bradley Street, Somerville 45, Mass. Telephone MOnument 6-4300
(For details, use Key # Q-12 on card on page 1)

cement-asbestos board which is classified as "0." Thus the lower the number, the better the classification. Today there are some fire retardant paint systems with a flame spread classification of "10."

This compares with a classification of "15" for ¾ inch sprayed on fibre and with a classification of 20–25 for pressure impregnated lumber.

When you come to specifying fire retardant paint, remember that the U.L. ratings are based on a specific rate of coverage—so many feet per gallon in so many coats. All U.L. tests are performed when the test paints have been applied to both Douglas fir wood and cellulose board. To aid you in your specification and use of fire retardant paints, the manufacturers of these products provide you with guides to their proper use. The U.L. listing data is also contained in the U.L. production inspection labels appearing on all cans.

From the manufacturer of approved fire retardant paints you receive basic technical data sheets that list the U.L. classifications together with the coverage they are based on in square feet per gallon. Also, you receive such information as the recommended undercoat and drying time and surface preparation for the variety of surfaces you wish to cover. This is standard service offered by the Paint Industry, and we're pleased to be able to extend it fully to apply to fire retardant paints as well. More specifically for fire retardant paints, you can receive either standard or individualized sets of specifications for the particular type of structure on which you wish to use the paint.

Of course we in the Paint Industry are workers who deal primarily with the development of paint. We cannot—at this stage—tell you in every case how, when and where to apply fire retardant paint. We are always anxious to have you share with us and other users your comments, experiences, praises and yes, your criticisms of fire retardant paint.

Our field is steadily expanding because we are constantly improving our products. Proof of the industry's progress is evidenced by the fact that a few years ago the best flamespread classification for any fire retardant paint was "35 to 45"—whereas today there are fire paint systems with a classification of 10 and with a time rating of 45 minutes when used on a standard wooden floor construction.

Fire retardant paints are good. They do what we say they will do. Because of that, prospective users should consciously look for areas where the application of fire retardant paint is warranted. These paints are a new and effective tool for strengthening fire protection. Furthermore the Paint Industry always welcomes opportunities to work with you in the evaluation and application of fire retardant paint as it applies to your own areas of responsibility.

The more you see of actual field tests—and the more actively you participate in them—the more fully will you realize that today's fire retardant paints have acquired new and greater stature than ever before. They have indeed graduated from their former status. They have

(Continued on page 40)

Ideal for the critical cleaning of Automatic Transmissions and Power Steering units.
DANGER
GAS
THE SAFE AND SANE WAY TO CLEAN
Automotive and Industrial Parts
Kleer-Flo Model 30 (less Jet Air Gun) also available
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CLEAN PARTS 3 WAYS—SAFELY!
1. Continuous Flow Hose
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For carbureters . . . ask for a Kleer-Flo CARB-U-TATOR Parts Cleaner using CARBUSOL Compound.
Rugged equipment that users enthusiastically say "pays for itself many times over in efficient time-saving, long trouble-free usage!" A continuous flow pump strains, filters and ejects abrasive foreign material and returns clean Kleer-Flo Hi-T Degreasol or M-467 Cleaning Fluids through the semi-rigid hose to the upper soaking tank. Fire hazard is reduced through the use of these high flash point solvents and by a quick action fusible link in self-closing cover.
Efficient patented electric pump is driven by a fan-cooled brushless, sparkless motor.
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2840 4th Ave. S. Minneapolis 8, Minnesota
SAFE! Fast drying—leaves no film

(For details, use Key # Q-13 on card on page 1)

Three thousand and fifty-one days without a disabling accident! This is the record piled up by the packaging department of the Grocery Products Division, Fisher Flouring Mills Company, Seattle. There are thirty-nine regular employees in the department, collectively representing 632 years of service with the company.

Employees also vie with one another in analyzing just how impressive their record is, in terms of comparisons. Here is the kind of "homework" they report: "If five men started working at the age of 20, and were employed in the packaging room five days a week, continuing until retirement at age 65, the total employed time of these five men would not equal the safety record which has been achieved."

Management recognition is given to the department each time that a record of another thousand days of work without time loss accident is chalked up. This is in the form of Totem Pole trophy which is larger each time. A dinner was given by the management shortly after the record of 3,000 days was achieved.

• • •

Departmental safety certificates were awarded at The Stanley Works recently to 16 superintendents and managers representing 127 departments in four company divisions (hardware, electric tools, steel strapping and steel) having no disabling accidents for a one to seven year period, January 1953 to January 1960.

The awards represent a combined total of 17,827,103 man-hours for the period without a disabling accident according to A. C. Schaffrick, safety director at the main plant in New Britain, Conn. For 29 departments, the awards are for a continuous seven year period, one department for six years, four departments for five years, 47 departments for four years, 13 departments for three years, 12 departments for two years, and 21 departments for one year.

• • •

The Bloomfield, N. J., plant of the Westinghouse Electric Corporation's lamp division has been awarded the National Safety Council's Award of Honor. The award is in recognition of the more than 4,300,000 man-hours worked without a disabling injury among the 3,400 employees during an eight month period.

• • •

Employees at the Aliquippa Works of Jones & Laughlin Steel Corporation established a number of safety records during 1959, it was announced recently by Paul H. Devaney, Works Manager. The more than 14,000 employees at Aliquippa surpassed the mark of a million manhours worked without a disabling accident on eight occasions, and established an all-time J&L Steel Works safety record of three million manhours without a disabling injury during the year. The three million manhour record resulted in a special honor citation from the National Safety Council.

In addition, new safety records were established in the low frequency of accidents and in reduced severity of accidents at the Works.

The all-time record for number of manhours worked without a disabling injury was established on January 13, 1959, following an accident-free performance which started on November 30, 1958, and continued for 44 days or 3,100,000 manhours.

The record started on December 12 still is continuing, Mr. Devaney said, and at the time of the announcement had surpassed the three million manhour mark.

The new low frequency of 1.54 accidents for every million manhours worked is a Corporation record, bettering the mark of 2.41 accidents per million manhours worked at the Pittsburgh Works in 1956. The former Aliquippa Works record was 2.55, established in 1957.

The severity of accidents, or number of days lost per million manhours worked, for 1959 was down to 298 at Aliquippa, Mr. Devaney said. This betters the 1955 record of 440 at the Aliquippa Works. The J&L record is held by the Cleveland Works which had a severity rate of 160 in 1957.

• • •

Employees at The Chemstrand Corporation Acrilan acrylic fiber plant have completed 3,000,000 consecutive man-hours without a disabling injury. The National Safety Council cited the Acrilan plant with the Award of Honor for this achievement and noted the plant had received seven previous awards for its safety record. The Alabama State Department of Industrial Relations also recognized the new safety record with its Certificate of Merit.

Edw. A. O'Neal, Jr., Chemstrand President, said, "Full credit must go to the Acrilan plant management and to each employee for this new

safety standard. Your present accomplishment will be but a milestone on the path to much greater safety achievement."

Carl O. Hoyer, Vice President and General Manager of Manufacturing, Engineering and Development congratulated plant employees and stated "This new safety record for the Acrilan plant reflects a safety-mindedness on the part of each employee that stems from a constant and effective team effort."

The Acrilan plant workers had worked 2,898,970 safe man-hours in 1958 prior to a lost-time injury, said Dr. Kenneth Johnson, Director of Acrilan Manufacturing. He said, "This new record is a continuing example of safety-consciousness on the part of all our employees. I am proud of this achievement and know that all efforts will be directed to reaching and passing our next safety level of 4,000,000 safe man-hours."

• • •

The United States Army's Award of Merit for "outstanding safety improvement" during the 1959 Fiscal year in the eight-state First U. S. Area was personally presented in the form of a silver plaque to Lt. General B. M. Bryan, Commanding General, First Army, by General Bruce C. Clarke, Commanding General of United States Continental Army Command (USCONARC), at a ceremony conducted recently at First Army Headquarters, Governors Island, N. Y.

First Army achieved an over-all 19 percent reduction of accidents, injuries, and costs.

Broken down, the actual figures were: 20 percent reduction of accidents; 10 percent reduction of injuries; and 27 percent reduction of costs resulting from deaths, injuries and damages.

According to Mr. Thomas H. Ayers, First U. S. Army Safety Director, the improvement indicates that one out of every 53 First Army personnel, including Army Reservists and National Guardsmen on active duty training, was involved in a recordable accident in 1959 as compared with the greater total of one out of every 43 during 1958.

The aggressive safety program conducted by First U. S. Army in its Area covering New York, New Jersey, and New England, includes continuous operation of remedial driver training schools; educational program for civilian and military supervisors and commanders; special troop information lectures on off-duty, off-post safety; winter and holiday driving hazards; buddy system in recreational activities; and safety on the range. Twice yearly safety inspections are made at most installations.

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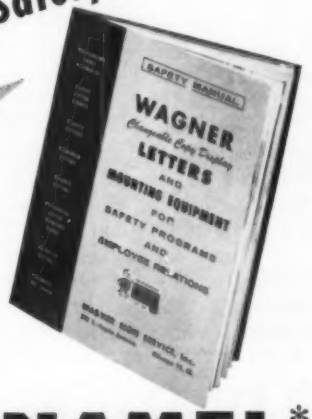
There is no safer place in the world for a steelworker than Lorain Works of U. S. Steel's National Tube Division. Recently, this

Free! – Data File on Potent Safety Promotion



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(For details, use Key # Q-14 on card on page 1)

plant broke an all-time industry safety record established in 1954. The plant went into its 8,260,000th man-hour of producing steel without a disabling injury. Prior to this the best no-injury record in the industry was held by the Johnstown, Pa., plant of Bethlehem Steel. Their record was 8,241,906 manhours without a disabling injury.

• • •

Sixty professional over-the-road drivers for Spector Freight System, Inc., operating out of New York City and Newark as a relay fleet, began the New Year right by completing one million miles of accident-free driving on Dec. 30 between the New York metropolitan area and Bedford, Pa.

The Newark-New York drivers set their record by moving every shipment of freight starting Oct. 4 over the first leg of the relay without a single accident.

At a banquet in their honor, the drivers were awarded shoulder patches commemorating their teamwork achievement and naming them members of the exclusive Million Mile Club, which was formed by Spector in 1956. Membership in this club honors the individual safe driving that produces the accident-free group record.

• • •

Two plants of the National Supply Co. established perfect safety records in 1959. The welded pipe mill at Etna, Pa., worked over 1,700,000 manhours without a disabling injury. The Torrance, Calif., machinery plant worked over 1,400,000 manhours without a disabling accident.

The plants will share the "Big Iron Man" Award, a trophy awarded annually by National's parent company, Armco Steel Corp., for the best safety records in its largest plants. At the end of 1959, the Etna plant had 373 "clear days" since the last major injury, on December 24, 1958. The Torrance plant had 713 clear days since the last major injury on January 17, 1958. Armco also has a Small Iron Man Award for plants under 1,000,000 manhours.

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WEAR PROOF MAT CO. 2156 W. Fulton St., Chicago 12, Ill.
For details, use Key # Q-28 on card on page 1)

Fire-Retardant Paint

(from page 37)

become more than a paint. They are approaching the ultimate goal of our industry's research. They are on their way to becoming indispensable functional engineering materials, without in any way sacrificing their essential and attractive decorative and protective qualities.

The Paint Industry has devoted a great deal of time, manpower and money to developing and testing fire retardant paints and telling users and specifiers about the new and improved fire protection abilities and availability of these paints. We have conducted so many large and costly "burning tests" in the field to prove the qualities of these paints, that some of us had to become specialists in planned "arson" as well as in chemistry.

Now that these paints have graduated—they deserve encouragement and employment where they can do the most effective fire protection jobs. We in the industry want to help improve and expand the progress made thus far in fire retardant paints. It can only be done if fire retardant paints are assigned to the many fire prevention jobs they are capable of doing.

Picture by courtesy of Alim Corp.

Carbon Dioxide System

(from page 34)

and stay out until you are told to return.

Evacuation fire drills are held periodically in the carbon dioxide protected areas. Employees in these areas are divided into groups of six with one captain for each group. The duties of the captain are:

1. Account for his people, making sure that they are all out of the area.

2. Be sure his exit door is closed so that the carbon dioxide will be concentrated within the area.

3. Keep his group from re-entering the area until the "all clear" signal is given.

Material by courtesy of Industrial Commission of Ohio's "Monitor." Pictures of Cardox equipment from Bendix Aviation Corp.

industrial hygiene

Industrial Health Conference

How to keep workers healthy by provision of better preventive medical service in industry and through control of potentially hazardous exposure in rapidly changing American technology will be themes of a national Industrial Health Conference to be held in Rochester, N. Y., on April 25–30, 1960.

The conference, an annual meeting, brings together physicians, nurses, engineers, toxicologists, chemists, dentists, and other specialists to discuss recent problems, developments, and progress in workers' health.

About 3,000 members from five participating organizations are expected to attend the conference sessions in the Rochester Memorial Auditorium. These include the Industrial Medical Association, American Association of Industrial Nurses, Inc., American Industrial Hygiene Association, American Association of Industrial Dentists, American Conference of Governmental Industrial Hygienists, as well as representatives of industrial management, labor, and others concerned with industrial health.

New Safety Health Guides

The first in a series of pamphlets to be known as Safety Guides has been announced by the Manufacturing Chemists' Association, Inc. "Health Factors in Safe Handling of Chemicals," is the title of the new publication developed as a part of the activity of the Association's General Safety Committee. The four-page publication is designed to help the non-chemist in the chemical plant become familiar with toxicological terminology, to understand ways by which noxious substances enter the body and exert their harmful effects, and to know the basic principles of first aid treatment.

The new series of guides will cover aspects of safety in chemical manufacturing which are not dealt with in the widely used chemical safety data sheets, also published by the Association. The second guide in the series, which will be published in the near future, will deal with "good housekeeping" in chemical manufacturing. Others are planned to cover such matters as "electrical switch lockouts," "entering tanks," and other safety matters of broad application. Safety organization, precautions against environmental hazards, fire, safety training also are possible topics.

The Association's safety data sheets, safe handling manuals, and other activities of the General Safety Committee are credited in the industry with contributing much to the establishment of an enviable safety standard. The 1958 industry record of 2.98 injuries per million man-hours worked is far below the record for all industry. It is anticipated that figures for 1959 will be available soon.

Copies of Safety Guide SG-1 are available at 15 cents each from the Manufacturing Chemists' Association, Inc., 1825 Connecticut Avenue, N. W., Washington 9, D. C.

Industrial Noise Dangers

A new pamphlet issued today by the U. S. Department of Labor suggests ways industry can cut down on noise—a hazard to workers which can cause hearing loss.

Cited were some on-the-job noises that can lead to deafness if workers are subjected to them for long periods of time. Jet motors at a distance of 75 feet blast away at 130 decibels up to the "threshold of pain." Circular saws register at 110 to 115 decibels, and punch presses at 90 to 110.

In contrast, average street noise hits 60 to 80 decibels and what is described as a "noisy home" measures 40 to 60. Each increase of 10 decibels indicates a 10-fold increase in sound intensity.

Early hearing damage is often unnoticed by a worker, the bulletin states, because loss usually occurs first in high frequencies above those important for understanding speech. Hearing loss may be temporary or permanent. Individual susceptibility can play a part in hearing loss, as well as noise intensity and frequency, length of exposure, and other factors.

Reduction in plant noise may be achieved, the pamplet says, by good engineering design, proper maintenance of machinery, and sound-absorbent materials. Other methods include substituting one process for another (such as spot welding for riveting), isolating noisy machines, enclosing noise sources, and using resilient machine mounting.

If all else fails, according to the pamphlet, industry

GLO-GLUVS*

REVOLUTIONARY ADVANCEMENT IN INDUSTRIAL WORK GLOVES

Maximum Visibility and worker safety are now provided by this new development . . . hands can really be seen! A natural for jobs where hand signals are used — night work, etc. Granet GLO-GLUVS have a special vinyl coating which offers maximum resistance to abrasion and solvents — and also provide a firm grip on objects covered with grease or oil. Equip your men with this safe rugged glove.

WRITE
*Trademark

Write on your letterhead for a free sample pair, or use reader service card for descriptive brochure.

THE GRANET CORP.
26 LORING DRIVE, FRAMINGHAM, MASS.

(For details, use Key # Q-15 on card on page 1)

GETS-A-LITE GUARD and GUIDE
Quickly and Easily Installed by Anyone — No Tools Needed!

- Simply slip GETS-A-LITE GUARD AND GUIDE over the fixture, as illustrated.
- Made of indestructible spring steel wire. Nothing to break, get out of order or replace. Will last indefinitely.
- Once installed, GETS-A-LITE GUARD AND GUIDE is NEVER removed.
- Nothing to unlock, fuss with or lock, when changing lamps.
- GETS-A-LITE GUARD AND GUIDE actually steers lamp into socket, enabling maintenance man to change lamp in 10 seconds!
- Available for 40 watt and 100 watt fluorescent lamps.

GETS-A-LITE Company—Dept. SM-40
3865 N. Milwaukee Ave., Chicago 41, Illinois

(For details, use Key # Q-16 on card on page 1)

may find it necessary to supply earplugs and earmuffs or helmets, or to rotate personnel.

The pamphlet, entitled "Controlling Noise Hazards," is the first in a series by the Bureau of Labor Standards on "Safety in Industry." Others will include a general discussion of environmental control measures and publications on low voltage electrical hazards and materials handling.

Sample copies of the 8-page brochure on noise (Bulletin 207) may be obtained without charge, as as long as the supply lasts, from the Bureau of Labor Standards, U. S. Department of Labor, Washington 25, D. C.

Antimony Danger for Heart Cases

In a new Hygienic Guide for *Antimony*, the American Industrial Hygiene Association warns against the placement of persons with a history of heart disease in any industrial exposure where antimony is present as an air contaminant.

The Association announced at the same time the publication of three other Hygienic Guides, namely *Hydrogen Selenide, Styrene Monomer*, and *Ethylenediamine*. This brings to a total of 88 the number of Hygienic Guides now available from the American Industrial Hygiene Association.

All of the guides provide confirmed data relative to degree of hazard in industrial exposures, specific medical procedures to be followed in event of poisoning, as well as tested procedures for identification and control. Each Guide contains a bibliography of the literature published to date.

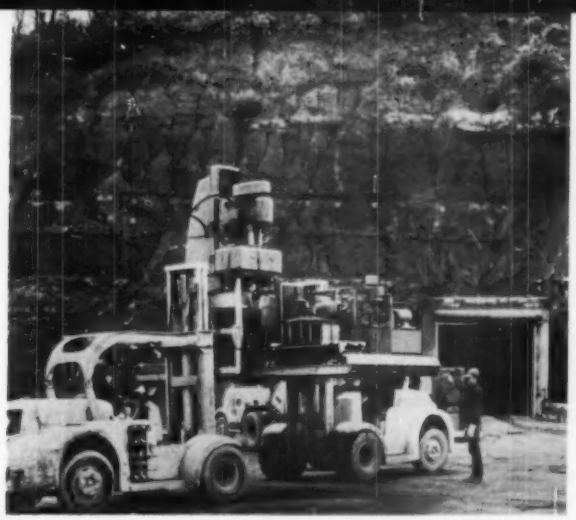
Information about the guides can be obtained from George D. Clayton, Executive Secretary of the Association, 14125 Prevost St., Detroit 27, Mich.

Noise Reduction Course at M.I.T.

The Massachusetts Institute of Technology announces that it will again offer a special summer program on "Noise Reduction" from Monday, August 22 through Friday, September 2, 1960. This two-week program will be under the direction of Dr. Leo L. Beranek, Department of Electrical Engineering, assisted by other M.I.T. faculty members and industrial engineers. The program will be taught on a case history and problem solving basis with a minimum of formal lectures. The foundation material will be derived from a new text on noise reduction to be supplied to all enrollees.

The program is directed toward the engineer who has been assigned a noise problem for solution. The first week's topics include behavior of sound waves, decibels, selection and use of instrumentation and sound in enclosures. The second week's subjects include structures and materials for absorption and attenuation of sound, mufflers, criteria for noise and vibration control and case histories. Students must attend both weeks. In addition to the class instruction, there will be exhibits, a field trip and entertainment features.

Truck Fumes Eliminated in Storage Cave



Pair of 15,000 pound, catalytic purifier-equipped fork trucks boosts tools, other equipment, as tractor pulls out from under.

By fitting its industrial trucks and gasoline sweepers with catalytic exhaust purifiers, Page Airways, Inc., Rochester, N. Y. has solved a potentially hazardous exhaust fume problem underground, in the world's largest subterranean storage cave. As contract-operator of the Government's Atchison (Kansas) Ordnance Storage Facility, Page is responsible for maintaining and rehabilitating several million dollars worth of machine tools.

Arriving by truck, rail and barge, these machine tools are ferried into and around the cave by gasoline-engine industrial trucks. Two gasoline-engine sweepers are also used for tidying up.

As many as 150 men may be working at a time in the 65 acre facility, which has complete temperature and humidity control.

Protection against accumulations of dangerous or irritating carbon monoxide or hydrocarbons from vehicle exhaust is assured by catalytic exhaust purifiers, which eliminate up to 95 percent of these exhaust contaminants by converting them to harmless carbon dioxide and water vapor.

With purifiers on the trucks, Page successfully keeps CO content in the cave to 10 to 100 parts per million parts air (.001 to .010%).

This is well below the 200 parts per million specified for the cave operation by the government safety regulations.

As a running check that men and equipment are properly safeguarded, one man's duty is to check fumes several times daily.

Machine tools are stored throughout facility by trucks fitted with carbon monoxide eliminating devices. Note purifier cage.

Formerly used for refrigerated food storage, the limestone mine was taken over from the Department of Agriculture by the United States Ordnance Corps in 1952, for storage and rehabilitation of tools brought in from deactivated war plants across the country.

The nature of the material handling problems made combustion-engine equipment (and, therefore, purifiers) a must. While many machine tools coming in are delivered to dock facilities at the cave entrance, by over-the-highway trucks, a large portion arrive by river boat and rail, and must be picked up from dock

(Continued on page 52)

What the Nurse Should Do About

by **WARD L. MOULD, M.D.**
Ophthamologist
Garden City, N. Y.

In all fields of work the plant nurse should be guided by the policies of the plant medical department as established by the plant physician. The recommendations contained herein should be disregarded in instances of conflict with such policy.

The symptoms associated with an injury of the eye are usually inversely proportional in severity to the importance of the wound. An injury of little consequence (a little dirt in the conjunctival sac) is likely to produce severe pain, tearing and redness, whereas a perforating injury may pass unnoticed because of a lack of symptoms. This is an important point to remember: When a workman comes to the first aid room complaining of unbearable pain there is rarely occasion for alarm. Do not panic. Proceed to care for him in an orderly manner. Calmness on the part of the nurse will be reassuring to the injured man.

Initial Examination

When an injured man comes to the first aid room:

1. Obtain a **brief** history as to the circumstances of the accident and **write it down.** "When drilling metal at 1:00 P.M. yesterday got something in his right eye" or "when pounding a pin was struck in the left eye," etc.

2. If pain is present, instill a drop of pontocaine 0.5% in the conjunctival sac.

3. When the anesthesia takes effect (about a minute) the spasm of the lids will subside so that the patient can open his eyes.

4. At this point **check the vision in both eyes,** the injured one first and then the uninjured, and **record the findings.**

5. The patient's eyes may then be examined. It is essential that all procedures be carried out as painlessly as possible. Be sure to instruct the patient to **keep both eyes open** and give him a specific object to look at—your mouth or nose, for example. When both eyes are open and he is doing as you have instructed, gently separate the lids of the eye to be examined so that a good view of the eye may be obtained. Frequently once the examination starts the patient will close the eye not under study. When this happens the eye being examined rolls upwards and the patient will reflexly squeeze the eye being examined. It is useless to proceed under these circumstances. Stop at once. Ask again that both eyes be opened and do not proceed until this is done.

A good light is necessary for proper examination of an eye, and, if it shines into the eye obliquely, abnormalities can be seen best. Use a light that focuses sharply for this purpose.

A binocular loupe will enable the examiner to detect small abrasions, foreign bodies and other abnormalities that might otherwise escape unnoticed. Nurses who do such examinations should become familiar with these devices.

After the examination, if a simple sketch is drawn, to illustrate positive findings it is likely to be more descriptive than a long narrative.

A foreign body sensation beneath the upper lid is characteristic of one of the following conditions:

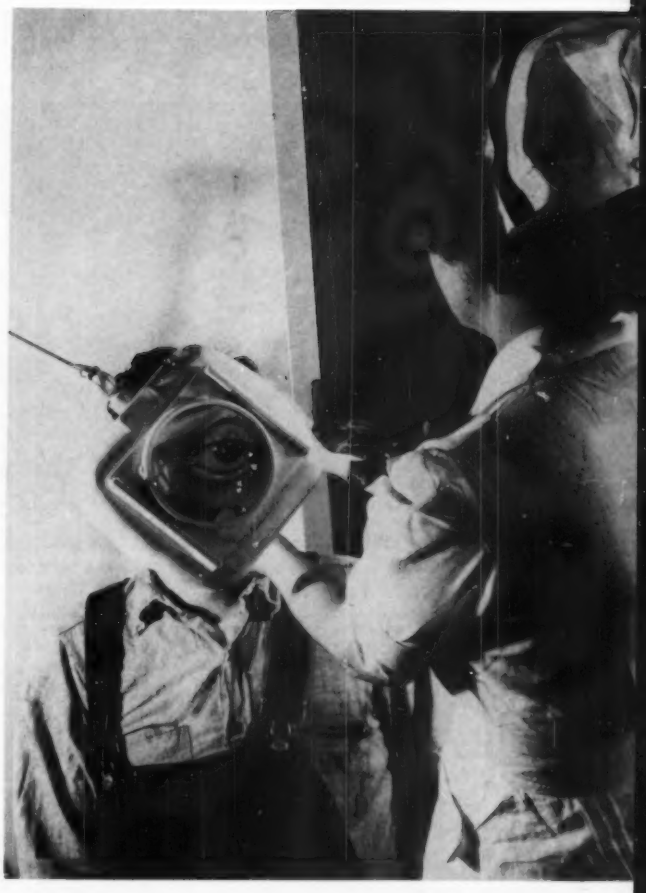
1. Foreign body in the conjunctival sac.
2. Foreign body embedded in the cornea.
3. Corneal ulcer, traumatic or due to other cause.

EYE EQUIPMENT AND SUPPLIES FOR PLANT FIRST AID ROOMS

1. **Vision Chart**
2. **Opaque object 2" x 5" to cover one eye when the other is being tested for vision.**
3. **Flash light—a pencil light that focuses sharply is excellent.**
4. **Anesthetic solution: Tetracaine 0.5% (Iso Sol #3)**
5. **Ophthalmic irrigating solution with plastic flush bottle.**
6. **Disposable paper tissues.**
7. **Ophthalmic ointments (Such as Sodium sulfacetimide 10% or Pontocaine 0.5%)**
8. **Small applicators or toothpicks wound with cotton (sterile).**
9. **Eye dressings (Sterile in envelopes)**
10. **Scotch tape or adhesive plaster—1/2 in. wide.**
11. **Eye drops (Such as Sodium sulfacetimide 30%, Isoptocetimide 15%, or Fluorescein 2%)**
12. **Binocular loupe.**

Eye Injuries

If vision is to be protected when an eye injury does occur, the plant nurse must take immediate precautionary steps in treating the injury.



The pain due to a foreign body in the conjunctival sac starts at the time of injury. If the foreign body is embedded in the cornea, or if the cornea is abraided, the onset of pain is usually delayed for several hours.

Procedures

1. FOREIGN BODIES:

A. Free in the conjunctival sac:

When the spasm of the lids has subsided after a drop or two of pontocaine, foreign matter and debris, which is free in the conjunctival sac, is easily located and removed. Foreign bodies frequently become adherent to the conjunctival surface of the upper lid. When located in this position, they can be seen as follows:

1) have the patient open both eyes and look down;

2) grasp the lashes of the upper lid and draw the lid downwards;

3) place an applicator on the skin surface of the upper lid and then turn the lid margin upwards exposing the under surface of the lid. Failure usually means that the patient has closed the second eye. If the foreign body is found, it is easily removed with a cotton-wound applicator. If the cornea has been abraided by the foreign body, treat as for an ulcer.

B. Embedded in the cornea:

Characteristically the pain of a corneal foreign body is referred to the upper lid. Be sure to examine the cornea in all cases having this complaint. Three or four hours usually elapse between the time of injury and the onset of pain. If the foreign body is not steel or iron, it is possible to dislodge it occasionally by moving the lid margin over it several times or by irrigation. However, a foreign body of steel or iron embedded rather firmly in the cornea is not so easily displaced. Furthermore, the salt and other chemicals in the tears cause the metal to rust within a few hours and the rust discolors the tissue around the foreign body. Such stains must be curetted clean or healing will be delayed. The wound caused by a foreign body embedded in the cornea should be treated as an ulcer (see below).

EYE PROTECTION SERIES
other articles March & May

Generally speaking, unless they have had unusual training and experience, nurses should not remove corneal foreign bodies with instruments. Attempts should not be made to remove corneal foreign bodies with cotton-wound applicators. This usually results in an extensive abrasion of the cornea requiring several days to heal and at the same time fails to wipe away the foreign body.

2. CORNEAL ULCERS:

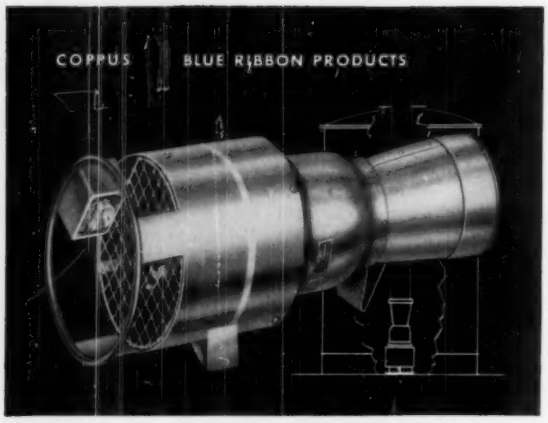
Corneal ulcers, whether traumatic or due to other causes, usually cause the symptoms of a foreign body beneath the upper lid.

A corneal ulcer can often be seen readily if the eye is examined with oblique illumination and with magnification. If an ulcer is suspected but cannot be seen, or if it is but poorly visualized, the lesion may be stained as follows:

Place a drop of fluorescein in the conjunctival sac and then irrigate the sac with sterile saline or with ophthalmic irrigating solution. If the cornea is examined again any break in the surface of the epithelium will be stained green.

Treatment of corneal ulcers:

An anesthetic ointment may be instilled to relieve pain and a sterile eye dressing should then be applied. Atropine should **not** be instilled routinely, for the resulting blurring of vision only prolongs the period of disability in most cases. Continuous use of anesthetic agents in an injured eye will retard healing of the wound. It is therefore wise to restrict the use of



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anesthetics to once or twice a day. Analgesia, to make pain tolerable, may be achieved by the use of codeine or aspirin or some similar preparation. It is wise to caution the patient that he is likely to have a recurrence of his pain when the effect of the anesthesia has worn off. The eye should be dressed not less than once a day until the lesion has healed.

3. FLASH BURNS OF THE EYES:

This is an injury which is quite common in industry and occurs when the eyes are exposed without proper protection to light of high temperature, such as a welding arc. Following exposure, there is usually a latent period of three or four hours before the onset of symptoms. The patient then experiences extreme sensitivity to light, he tears profusely, and has the sensation that there is sand in his eyes.

Before examination is possible, it is usually necessary to anesthetize the eyes with pontocaine or some similar agent. When spasm of the lids has subsided so that they can be opened, the examination may be carried out. The white of the eye will be engorged. The normal luster of the cornea will be disturbed in most cases and if the eye is stained with fluorescein, as described above, a multitude of fine ulcers will be seen. These will occur in the exposed areas of the cornea only. Frequently there will be a well defined line beyond which there will be no injury. This is because lids covered a part of the cornea and protected it.

Treatment of flash burns:

There is little by way of specific treatment once the injury has occurred. The patient will be more comfortable if he is kept in subdued light. Codeine and aspirin will help him to tolerate his pain. Cold compresses are very soothing when applied to the face.

4. CHEMICAL INJURY OF THE EYE:

There is a very wide variety of solutions used in industry and any of these may at times be splashed into the eyes. The type of material introduced is of little importance if first aid treatment is commenced immediately. The eye should be thoroughly flushed with a copious amount of water. Special solutions are not required. Plain tap water is better, if convenient, than a special solution one must wait for. If the material causing the injury contains plaster or lime the injury to the eye is likely to be extensive unless it is properly cared for. These substances are apt to become embedded in the tissues or even the cornea; and so long as they remain in contact, their caustic action will continue. The chemical may cause an erosion of the surface of the cornea or of the conjunctiva or both. Following irrigation, a patient with such wounds should be seen by a specialist. Paint and paint thinners frequently splash into the eye. Usually they cause little more than a chemical irritation if the irrigation is profuse and prompt.

5. INTRAOCULAR FOREIGN BODIES:

This is a condition that one must always think of when caring for an injured person. Beware of the man who, when striking metal with metal, felt something strike his eye, especially if on examination you are **unable to find a foreign body.** Always remember you may not see it because it has perforated the outer

shell of the eye and is now lodged within. Usually there is no pain and often no inflammation associated with the condition. **Send all such patients to a physician.**

6. INFECTIONS OF THE CONJUNCTIVA:

Conjunctivitis is a common condition, of course. The individual has a scratchy sensation, the eyes are inflamed and—most typical of all—there is a profuse discharge of pus. Almost invariably the lids will be glued when the patient wakes from sleep. Treatment should be directed toward the control of the condition in the patient and its prevention in others. Sulfonamide drops will usually be sufficient to control the condition. The corticosteroids should **not** be used for this condition or in combination with other drugs. Indeed, they should not be used in the first aid room for the treatment of eye conditions except under the direction of a specialist.

To prevent the spread of infection to others, those with infectious conjunctivitis should be sent home until they have recovered. If an infected person is examined, it is important to use a sterile technique to prevent the contamination of the articles and medicines on the dressing and treatment table.

7. PERFORATIONS OF THE EYE:

Injuries which result in the perforation of the outer coats of the eye are encountered all too frequently in industry. We have already mentioned one injury of this type, namely, intraocular foreign bodies. However, the eye is sometimes lacerated by sharp instruments; pierced by drill bits, nails or pieces of wire; or cut by fragments of glass or other sharp objects.

Any injury which results in the perforation of the eye is serious. The structures within are often damaged. The break in the surface allows the introduction of pathogenic bacteria directly into the eyeball. In addition to these hazards, there is always the danger that the ocular structures will prolapse through the wound—a point of special importance in the initial management of this condition. If the lids are squeezed by the patient or if in examination even slight pressure is applied to the lids, the intraocular contents may be expelled.

For these reasons the following precautions should be observed:

1. In some instances the history is likely to suggest that the patient has sustained a perforating wound. For example the patient may state that his eye was cut by a knife or was jabbed by a sharp instrument. In such circumstances, it is wise not to attempt an examination of the injured part. Place no medicines of any kind in the eye. Make no attempt to clean it. Simply place a sterile dressing over the eye to protect it from contamination. Urge the patient to keep **both** eyes quietly closed and send him to a specialist.

2. In some instances the history will not be conclusive or suggestive so that the patient will be examined. In such cases if a perforation has occurred, there are signs suggesting the true state of affairs.

Such signs are as follows:

a. There may be a visible laceration and intraocular structures may protrude through the wound.

b. There may be no apparent space between the

(Continued on page 52)

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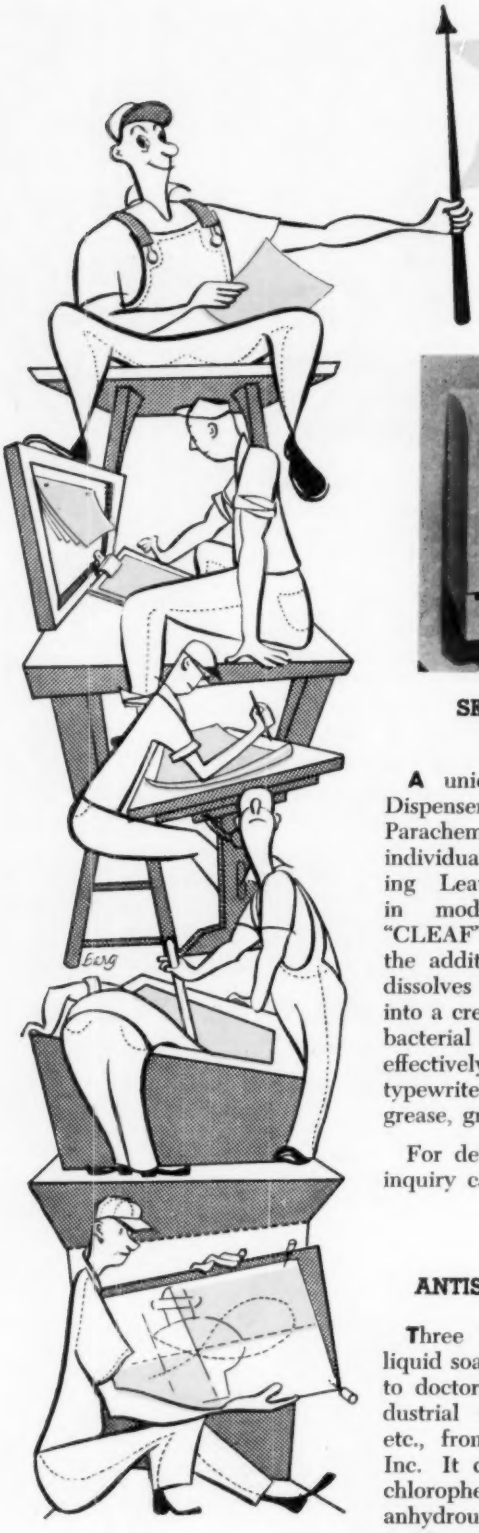


SKIN PROTECTION SERIES
other articles Feb. & March

SKIN CLEANSER IN SHEET FORM

A unique new cleansing film Dispenser is manufactured by Parachem Corporation, to dispense individual "CLEAF" Skin Cleansing Leaves—the latest advance in modern personal hygiene. "CLEAF" is a pure film, that, with the addition of very little water, dissolves instantly and completely into a creamy lather. Gentle, antibacterial and deodorant, "CLEAF" effectively removes dirt including typewriter and carbon stains, oil, grease, graphite, etc.

For details, use **Key # SP-1** on inquiry card on page 1.

ANTISEPTIC LIQUID SOAP

Three forms of an antiseptic liquid soap, Surgesol, are available to doctors, hospital personnel, industrial workers, food handlers, etc., from Davis-Weil Mfg. Co., Inc. It contains 2% G-11 Hexachlorophene on the bases of the anhydrous soap present. This antiseptic content provides a septic skin surface for occupations requiring it and also helps to minimize dermatitis in industrial operations. The regular grade offers 10 to 13% soap concentration as prescribed in USPXV. Surgesol Concentrate 25 is used as is or diluted with 1 to 1½ parts water for 10 to 13% concentration. Surgesol Super Concentrate 40 may be used as is or diluted with up to 3 parts water. The products are available in 65, 55, 35, 30, 15, 10, and 5 gallon drums.

For details, use **Key # SP-2** on inquiry card on page 1.

NEW BACK PANEL FOR WASH FOUNTAIN

The stainless steel foot-controlled Duo-Washfountain made by Bradley Washfountain Co. may now be supplied with a back panel which is an integral part of the unit. This panel which is shown in the accompanying photograph extends the width of the bowl interior and is the height of the sprayhead. It serves as a splash panel to protect wall areas and is easily cleaned.

For details, use **Key # SP-3** on inquiry card on page 1.

PROTECTIVE SILICONE AEROSOL

Protective lotion style products have been available for several years to industrial workers, nurses and laboratory technicians who

must, by the nature of their work, immerse their hands continually. By incorporating silicones, which resist penetration by liquids, to these formulae and by changing the methods of application from lotions to aerosol sprays, the A. E. Halperin Co. has developed a product that offers greater efficiency and economy. One of the features of this new aerosol method of packaging and application is the ability of the propellent, such as Freon, to blend perfectly with the established formula.

For details, use **Key # SP-4** on inquiry card on page 1.

ANTISEPTIC SOAP IN UNIT PACK

The accepted procedure for treatment of an abrasion, puncture, laceration or other type of wound is to cleanse it thoroughly with soap and water, preferably a mild antiseptic soap that will inhibit the growth of bacteria, reducing the danger of infection. The packaging of Hexachlorophene Soap in unbreakable plastic bottles, when placing these bottles in Unit Packs to fit into any size or style of First Aid Kits, makes available a mild antiseptic that can be used with or without water.

Hexachlorophene impedes the growth of bacteria, allowing the wound to heal naturally. It causes little or no discomfort to the most sensitive wound areas. Unit Packs are available containing a 2 oz. plastic bottle of Hexachlorophene and four 2 × 2 sterile gauze pads, available from all Bullard Industrial Safety Distributors and from E. D. Bullard Company.

For details, use **Key # SP-5** on inquiry card on page 1.

ATHLETE'S FOOT PREVENTIVE FOOTSPRAYER

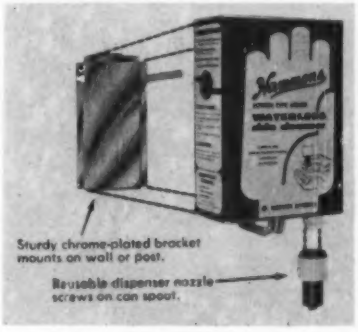
A new footsprayer to dispense a skin-toughening solution for the prevention of athlete's foot is being manufactured by Onox, Inc. When bathers step on the treadles, four jets spray feet and toes thoroughly. The footsprayer effects increased economy, the company reports, dispensing medication at a cost of approximately 1/10 of a cent per treatment. The product is made of Fibreglas and high-density polyethylene with a non-skid rubber base. It is sanitary, easy to clean and service, and holds a gallon of solution, sufficient for more than 3000 treatments.

For details, use **Key # SP-6** on inquiry card on page 1.

HAND LOTION FOR SOLVENT USERS

A new formulation to keep hands smooth, and prevent chapping and cracking after frequent washings, has been announced by the Fisher Scientific Co. The company reports that Gramercy Skin Lotion, a non-greasy skin protector, is effective for chemists, who work with acetone, methanol, ether, glassware detergents, etc., and for clinicians, who use alcohol, xylene, chloroform, benzene, and strong caustics. The lotion container comes equipped with a pump-dispenser for convenient application near the lab sink.

For details, use **Key # SP-7** on inquiry card on page 1.



DISPOSABLE DISPENSER OF WATERLESS SKIN CLEANSER

Hammons Products, Inc., has introduced a new gallon-size disposable dispenser for their liquid waterless skin cleanser used widely by people whose jobs require frequent waterless hand washing. The new package is an enamel-lined can with a stylized lithographed wrap-around label executed in distinctive blue on white. One product identification panel and one directions panel are printed inverted so they may be read when the container itself is inverted into dispensing position.

The tin container has a plastic spout and screw-on closure. A reusable dispensing nozzle of Ham-

mons' patent fits the spout. In use, the container is inverted, placed on a wall or post bracket and is held in place by a pull-down clamp which vents the container as it locks the can in position. Hammons claims the new dispenser reduces wash-up costs by one-third or more because no refilling, maintenance, or servicing is necessary and because the creamy, lotion-type cleanser—with Hexachlorophene, glycerin, lanolin and other USP grade ingredients—quickly removes rough soil.

For details, use **Key # SP-8** on inquiry card on page 1.

DISPOSABLE BATH TOWELS

A disposable, one-time use cotton bath towel is offered by B. H. Jordan Co., at a price below the cost of laundering the traditional bath towel. This towel is produced of highly absorbent cotton bonded by a new binder which overcomes the high cost of weaving and imparts great strength.

For details, use **Key # SP-9** on inquiry card on page 1.

POISON IVY TREATMENT

One of the oldest plagues of mankind is a plant that contains the chemical "Urushiol." Contact with it means hours of irritation to most everyone. Urushiol is found in Poison Ivy and Oak, Swamp and Poison Sumac, Markweed, etc. E. D. Bullard's FORMULA with Hectorite is a new concept developed for the treatment of Poison Ivy, Oak and Sumac. Packaged in 1-ounce non-breakable plastic bottles, packed three to a single Unit Pack, each of these Units is wrapped in waterproof Polyethylene and may be kept in First Aid Kits or carried easily in a pocket or glove compartment. Hectorite is a pure mineral with endothermic properties. When the Formula is rubbed onto the irritated area a cooling sensation is produced. The product does not contain Phenol, Menthol, Camphor, Alcohol, Oil or any irritating chemicals, and may be used around the eyes and other sensitive areas of the body. When Bullard's Formula dries it forms a protective coating over the irritated area. The color of the product is neutral and once applied, is difficult to see without close inspection.

For details, use **Key # SP-10** on inquiry card on page 1.

PROTECTIVE SKIN LOTION

A new skin protective product, available from the Vanfaire Co., provides an invisible protection against resulting rashes for the industrial worker with hands exposed to chemicals, oils, grease, solvents, plastics, and paint. Applied like any hand lotion, it is soluble in soap and water and protects the hands up to 12 hours. After many tests it is now reported being used widely by the plastic, aircraft, electronics, and chemical industries.

For details, use **Key # SP-11** on inquiry card on page 1.

Work Injuries
(from page 28)

nent physical impairment, ranging from the amputation or partial loss of use of a finger or toe to complete inability to engage in any future gainful employment. The remaining 1,872,000 injuries each disabled a worker for 1 full day or more after the day of injury, but resulted in no permanent ill effects.

Altogether, these injuries resulted in approximately 41 million man-days of disability during 1959. When the future effects of the deaths and permanent impairments are evaluated and added to the immediate loss, the total attributable to the 1959 injuries will amount to approximately 168 million man-days of disability—equivalent to a year's full-time employment of about 540,000 workers.

The principal increase in injuries occurred in manufacturing, from 340,000 in 1958 to 400,000 in 1959. Increased employment and hours of work, accompanied by a 10 percent increase in the injury rate, contributed to this increase of 17 percent in the volume of injuries.

In contract construction, injuries increased 11 percent, as a result of an increase in both employment and injury rates.

Only mining showed a decrease in injuries, due almost entirely to lower employment. Coal mining, according to reports to the Bureau of Mines, showed the lowest volume of injuries and deaths for any year on record.

Highway Safety Plans

Nils A. Lofgren of Chicago has been named director of program planning for the Insurance Institute for Highway Safety, Washington, D. C. The appointment was announced by Russell I. Brown, president of the Institute. Lofgren, a 10-year veteran in traffic accident prevention work, will be responsible for coordinating staff planning and services in the IIHS direct assistance program for states.

Prior to assuming his new duties, Lofgren was program consultant in the Field Service Department of the National Safety Council, Chicago. Earlier he served as direc-

(Continued on page 55)

Radioactive Material Fires
(from page 32)

road freight yard where a wooden crate labelled as carrying radioactive uranium metal was found smoldering. The fire was extinguished readily. Fire department radiation monitors, who responded to the alarm along with an engine company, measured a small but not dangerous amount of radiation.

(4) One man was killed and eight others injured by a severe explosion which wrecked an industrial metallurgical laboratory handling radioactive materials. Mildly radioactive metallic thorium was being burned, a small quantity at a time, when it exploded for an unknown reason.

Another explosion of a larger quantity of the metal was touched off by the first blast.

Approximately seventy firemen responded, but little fire remained after the initial flash. The fire department had been trained in radiation hazards and was aware of the necessary precautions which had to be taken. Self-contained breathing apparatus was worn to protect against inhalation of radioactive materials.

Monitoring of the firemen before leaving the scene revealed that several had their equipment slightly contaminated by radioactive material. Medical checks of all exposed firemen revealed no detectable intake of radioactive materials, although four laboratory workers present in the building at the time of the explosion received small amounts that did not exceed permissible limits. No significant radiation was detected outside the affected building. Atomic Energy Commission, Civil Defense and local health officials, along with trained fire department monitors, assisted in measuring the extent of the radiation hazard.

(5) A needle containing radium was accidentally thrown into an incinerator at a hospital. A Battalion Chief and a member of the local health department, both of whom had received radiation monitoring training, found the needle with a Geiger counter.

(6) A truck carrying solid uranium metal was involved in an accident; fire resulted from rupture of the truck's gasoline tanks. The local fire department responded but was misinformed by incompletely trained guards accompanying the shipment about possible hazards from use of water on the fire. The fire was allowed to burn until the arrival of an Atomic Energy Commission contractor fire department which extinguished what remained of the fire with water. Radiation contamination was negligible.

(7) Fire was discovered in an unoccupied university laboratory early one morning. Firemen entered the building, but the chief, having determined that the building contained radioactive material, ordered his men out and proceeded to fight the fire from the outside. The Fire Prevention Bureau had made prior arrangements for the proper university authority to be notified in case of an emergency in the building, but it was not until twenty minutes after the fire department reached the scene that such person arrived. Only then was the radioactive material found to

(Continued on page 55)

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(For details, use Key # Q-21 on card on page 1)

The Nurse and Eye Injuries
(from page 47)

iris and the back surface of the cornea. If there is such a space in the uninjured eye, it suggests that the fluid inside the eye has escaped.

c. The pupil may be deformed or displaced.

Treatment should be limited to the protection of the eye from injury and contamination until the patient can be seen by a physician. No medicines should be instilled. Simply apply a sterile dressing to the closed eye.

8. CONCUSSION INJURIES TO THE EYE:

Injuries of this type occur when the eye is struck with considerable force. The condition may take one of several forms, depending upon the character and the site of the injury.

1. There may or may not be discoloration of the lids. If this does occur, its extent may be somewhat limited if cold packs are applied. In general, however, such conditions are self limited and clear completely whether treatment is instituted or not.

2. Hemorrhage into the anterior chamber: Following a blow on the eye there may be a sudden outpouring of blood that will fill the space between the cornea and the iris. In other instances the fluid in this space is not completely replaced by blood but it may be tinged with it. Patients so afflicted should be placed at complete rest as quickly as possible. No medicines should be placed in the eye. They should be seen by a specialist who should supervise their care.

3. Injury may involve internal structures frequently with no outward manifestation to signify the seriousness of the damage which has been done. In such instances, beyond a serious disturbance of vision, there may be no other clinical finding. These patients, too, must be sent to a specialist for observation and treatment.

9. SUBCONJUNCTIVAL HEMORRHAGE:

This is a relatively common condition of little consequence but because of its spectacular appearance, its occurrence causes grave concern on the part of the patient. The condition occurs when one of the very fine vessels beneath the conjunctiva ruptures and blood escapes into the tissues. Often the condition occurs at night and is discovered by the patient as he stands before his mirror. Or his condition is called to his attention by a fellow workman. There are no associated symptoms, but the bright red color of the blood against the white of the eye is very startling. The area of involvement enlarges for a day or so—not because bleeding continues—but because the blood spreads out. It is gradually absorbed whether treatment is instituted or not.

Nurses should not attempt to diagnose serious and complicated conditions such as iritis, glaucoma, etc. We realize the employee in his search for help will often go to the Plant Medical Department. It is important, therefore, that the department have a policy regarding the referral of patients for specialist care.

The following simple rules are suggested:

1. If a person has an eye which is red, or painful or both and the cause is not obvious, the patient should be referred.

2. If the patient has symptoms which persist beyond what is usual—refer him.

3. Patients who have but one eye, or who have serious impairments in one eye, should be seen by a physician for even trivial injuries to their good eye.

From an address presented at the 29th Annual Greater New York Safety Convention. Picture by George Pickaw from Three Lions.

Truck Fumes Eliminated
(from page 43)

facilities at a much lower level, several hundred yards away.

Thus, fork lift trucks handling the incoming machines had to be adaptable to combined indoor-outdoor operations, with 100 yards of their several-hundred-yard outdoor run up a steep, 11% slope.

Then—once inside the cave—trucks must make long, fast runs ranging from a few hundred yards to a half mile or more.

These factors, together with initial economy of cost, made gasoline equipment the choice. At first there was no major fume problem, the cave ventilating system doing a good job of keeping main passageways clear of CO. But as activities were stepped up and additional vehicles were added, buildup of monoxide in certain cave areas and pockets became alarming. Specialists were called in to recommend the proper catalytic purifiers for the equipment involved, and the units were installed. Normal ventilating problems were aggravated by the need for keeping the mammoth cave at a constant 70 degree temperature, with relative humidity held to 35 to 40 percent. Fresh air brought in from time to time, as needed, is funneled through a specially built dehumidifier (only one of its kind in the world) capable of removing one ton of moisture per hour, with a complete cave-air change every 30 minutes.

As a running check that men and equipment are properly safeguarded, temperature, humidity, and CO content of the air are checked several times a day at various points in the cave by one man who is given the job as a full-time assignment.

To guard even further against hazards of CO buildup, each truck and sweeper is kept in perfect operating condition in a large maintenance shop inside the cave. Every 30 days, the exhaust of each truck is checked with a CO tester, and purifier units are replaced as necessary. While Page has not kept accurate records, they estimate the purifiers' average life is 3000 hours or better. Catalytic innards of the units can then be replaced on an economical exchange basis.

The units are installed on 12 vehicles—six 15,000 lb. trucks, two 10,000 lb. trucks, two 6000 lb. units, and two power sweepers, all burning non-leaded gas.

In operation, hot exhaust gases are streamed through nests of catalyst-coated porcelain rods, promoting an oxidation reaction. This consumes incompletely burned contaminants at relatively low temperatures. Gases are thus exhausted as harmless carbon dioxide and water vapor. More than 7000 such units are now installed on gasoline, Liquified Petroleum Gas (LPG), and diesel equipment throughout industry.

Pictures by courtesy of Oxy-Catalyst, Inc.

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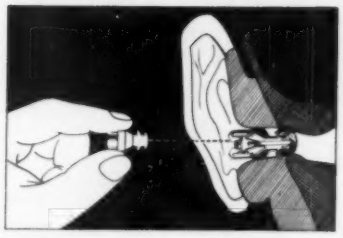

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(For details, use Key # Q-29 on card on page 1)

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(For details, use Key # Q-31 on card on page 1)

Plastic Scrubbers Help Solve Air Pollution

The chemical industry and others using chemical processes are solving the air pollution problem by the use of light-weight plastic packed column scrubbers, according to a report made during the 42nd National Meeting of the American Institute of Chemical Engineers.

The report was made by Fred W. Arndt, Heil Process Equipment Corporation, Cleveland, O. The scrubbers which remove dust and gas by absorption "possess unique economies where weight is critical, such as for roof-mounted locations," he observed. "Reduction, or in some cases elimination, of expense for reinforcing the scrubber location is significant.

"Excellent corrosion resistance, external as well as internal, has reduced maintenance to a minimum."

Initial price of the plastic scrubbers is moderate and generally lower than equipment made of lined steel or alloy, he said.

Jewelers Beat Air Pollution Problem

Manufacturing jewelers in midtown New York were ruby-red faced when they found they were the cause of a series of air pollution complaints. Tenants in the upper floors of nearby buildings, higher than theirs, complained (coughingly) of smoke and odor from the jewelers' smokestacks.

The pollution was the result of the melting of castings. In the melting process, the burn-off of paraffin created a mass of smoke and most unpleasant odors. These went up the chimneys of the smaller buildings to the great discomfort of high-floor tenants nearby. Authorities said it must stop!

Jewelers dropped the problem in the lap of Pilot Gas & Heat Service Corp., a firm specializing in gas heating installations. Mr. Alan Leff, Pilot's general manager, came up with a solution that pleased everyone—the jewelers, Air Pollution Control Authorities, and the neighbors.

Mr. Leff found that by varying the temperatures and setting up a series of four heating cycles for the melting process, both smoke and odor would be drastically reduced. To this, he added the suggestion that melting be done at hours when the other buildings were closed. Mr. Leff was not suggesting that jewelers burn the midnight oil—but he did set up a system of automatic controls.

He used four solenoids to apply the gas heat at the proper temperatures in the required sequence cycles. The solenoids are controlled by a time switch which makes the melting process completely automatic. It's set by a series of trippers on a 24-hour dial and repeats the same operation daily without manual attention. Mr. Leff set the units so that the melting process starts at 4:00 a.m. daily. The switch activates the solenoid and the first heat is applied. At 5:00 a.m. the unit activates the second solenoid for more heat, and again at 6 and 7 o'clock. By 8:00 a.m., it's all over.

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Has your company put in the Payroll Savings Plan? If not, start now! Or, perhaps you want to increase participation in an existing Plan? Just contact your State Savings Bonds Director and he will gladly help put this Plan to work. Or write Savings Bonds Division, U. S. Treasury Department, Washington 25, D. C.

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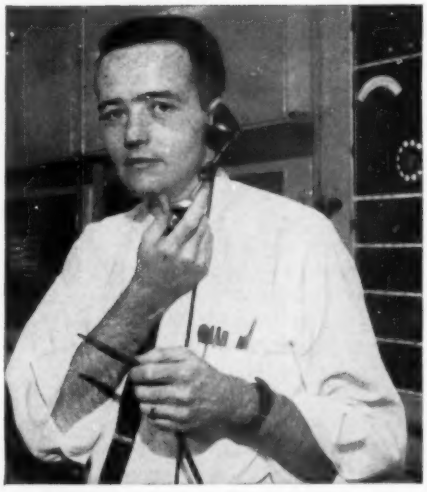

CORNELIUS J. MANNING, skilled technician in one of America's communication centers, is typical of many thousands of payroll savers in industry and business who are buying U. S. Savings Bonds regularly.

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Research on Skid Resistance

A new approach to skid-resistance measurement—use of standard surfaces of known slipperiness—will be attempted by a new ASTM Committee, E-17 on Skid Resistance. At the first meeting of the steering committee, held in Washington, D. C., Dec. 16, 1959, chairman pro tem A. T. Goldbeck, engineering consultant, National Crushed Stone Assn., reviewed the story behind the proposed formation of the committee, starting with the International Conference on Skid Prevention held in September 1958, which revealed a need for standardization of equipment and test methods used in measuring skid resistance of pavement surfaces.

Preliminary Work

The committee's primary task will be to develop standard test vehicles and standard surfaces for calibration purposes. The scope proposed by the steering committee:

1. To develop and standardize field and laboratory methods of test for determining (traffic) surface slipperiness.

2. To develop and standardize methods of test for the use of a set of standards of surface slipperiness.

3. To stimulate research to accomplish objectives (1) and (2).

The list of organizations that have been invited to participate in the activities of the new committee include highway departments, universities, the Tire and Rim Assn., the National Bureau of Standards, and the National Safety Council. It is hoped that the Highway Research Board will be able to stimulate much of the needed research, and that the Bureau of Public Roads will be among the organizations that will undertake the necessary field work.

The organization meeting of the committee will be held during the 1960 ASTM Annual Meeting in Atlantic City, N. J., the week of June 26–July 1. Anyone interested in taking part in the activities of the committee should get in touch with ASTM Headquarters.

Radioactive Material Fires

(from page 51)

be safely stored in a concrete vault where it had at no time presented any threat to the firemen. A warning sign located some distance from the vault may have mislead the firemen into believing that dangerously radioactive material was exposed within the building.

(8) Another laboratory fire originated in paper towels that had been used with nitric acid to clean up radiation contamination. The contaminated waste was stored in a metal basket in the basement. Spontaneous ignition of the acid-soaked paper resulted in a minor fire which spread smoke contaminated with radioactive material throughout the building.

Firemen, wearing respiratory protective equipment and protective clothing, brought the fire under control in fifteen minutes time. All fire fighting equipment was left at the scene of the fire for decontamination. Surface contamination resulting from the fire was limited to the floor and an elevator shaft which formed a flue for the rising smoke. Normal operations were resumed in the building the following day.

Highway Safety Plans

(from page 50)

tor of field services for the Citizens Traffic Safety Board of Chicago. Before that, he served in the School and College Division of the National Safety Council.

The Insurance Institute for Highway Safety was formed in January, 1959, by the Association of Casualty and Surety Companies, the National Association of Automotive Mutual Insurance Companies, and the National Association of Independent Insurers to fight traffic accidents on an industry-wide front. These three associations represent 532 casualty companies which write about 80 percent of the nation's automobile insurance.

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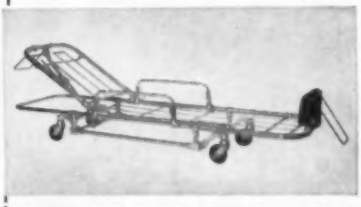

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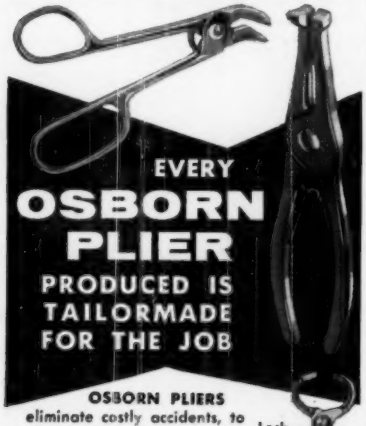

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Masonry Wall Conference

Harry C. Plummer, director of Engineering and Technology, Structural Clay Products Institute, Washington, D. C., will head up a comprehensive program on insulated masonry cavity walls at the Building Research Institute's 1960 Spring Conferences, April 5–7, in New York City. It will bring together ranking specialists in masonry construction and will review progress since the BRI Conference on Modern Masonry in 1956.

Among scheduled speakers and panel leaders will be Neils Thompson, University of Texas; Cyrus C. Fishburn, National Bureau of Standards; C. Thomas Grimm, Zonolite Co., Chicago; Harry B. Zackrison, Sr., Office of Chief of Engineers, U. S. Army; Clarence P. Litchfield, of LaPierre, Litchfield & Associates, architects, New York City, and C. B. Monk, Jr., manager, Engineering and Architectural Research, Structural Clay Products Research Foundation, Geneva, Ill.

The section on masonry cavity walls, one of six concurrent programs at the Spring Conferences, will be held in the Statler-Hilton Hotel on April 5. It is intended to provide for the construction industry and architects, engineers, builders and product manufacturers associated with it, the first review of progress in masonry design and construction in the last five years. Discussions premised on newest research data will include new methods for design of insulated cavity walls with regard to heat, vapor and water transmission characteristics and on other factors affecting design and construction.

Other programs during the BRI Spring Conferences will include those on Adhesives in Building, Surface Preparation and Field Application of Paints and Coatings, an information workshop on plastics used in construction, a roundup of college and university building research projects, a series of proposals for new building research and a conference on Air Cleaning and Purification.

The Spring Conferences also will be the scene for the first presentation of the annual F. Stuart Fitzpatrick Memorial Award, during a luncheon on April 6. The recipient will be Norman P. Mason, Administrator of HHFA.

The three-day program is open to the interested public as well as to BRI members and guests. Information may be obtained from Milton C. Coon, Jr., BRI executive director, 2101 Constitution Avenue, N.W., Washington 25, D. C.

"And for-the-love-o'-Pete, get some safety shoes. Then if you drop your end, like this, you won't get hurt."

Film on Foam-Water Extinguishing System

Availability of a 15 minute, color, sound film on the installation and operation of a foam-water deluge system of fire prevention and protection has been announced by the "Automatic" Sprinkler Corporation of America.

Showing the actual operation of a 60,000 gallon-per-minute mechanical foam-water system, the film also portrays advantages of such a system applicable in the chemical, utility, aircraft and general manufacturing industries where special hazards involving the use of flammable liquids exist.

Requests for viewing, and inquiries concerning the film, should be directed to R. J. Buchanan, manager Special Hazards, the "Automatic" Sprinkler Corporation of America, Youngstown, Ohio.

Revised Safety Code for Head, Eye and Respiratory Protection

The average American worker, statistically safer on the job than at home or on the roads, will enjoy an added margin of safety as the result of the recent revisions to the American Standard covering safety glasses, respirators, and hard hats. The newly revised American Standard Safety Code for Head, Eye, and Respiratory Protection, Z2.1–1959, is available from the American Standards Association.

The purpose of the 46-page standard is "to provide reasonable and adequate means, ways, and methods for the proper selection and safe use of head, face, neck, eye, and respiratory protective equipment." It applies to all operations or processes except those relating to communicable air-borne diseases or x-rays, gamma rays, and high-energy particulate radiations such as alpha, beta, or neutron rays.

Plastic Eye Protectors

Changes made since the previous 1938 edition include the addition of plastic eye protectors, and an increase in strength requirements for eye protection. One section contains 86 definitions of words common to this field. In general, the code has been brought up to date with modern production methods working environments and available safety equipment.

The code dates back to standards developed jointly by the War Department, the Navy Department and the National Bureau of Standards. An advisory committee of 19 men selected for their knowledge of the subject, with these standards as a basis, drew up the first edition of the code in 1920.

A second and a third edition were revised by a sectional committee organized under the procedures of ASA, and were published in 1922 and 1938 as National Bureau of Standards Handbooks.

The code is sponsored under ASA procedures by the Department of the Navy, the National Bureau of Standards, and the U. S. Bureau of Mines. A total of 33 national groups are members of the ASA sectional committee which prepared the latest revision.

The American Standards Association is the clearinghouse and coordinating body for voluntary national standards. It is a federation of 120 trade associations, technical societies, and consumer groups, with more than 2,000 company members.

American Standard Safety Code for Head, Eye, and Respiratory Protection, Z2.1–1959, 48 pp., is available at $3.00 a copy from the American Standards Association, Dept. PR121, 70 East 45th Street, New York 17, New York.

Industry and Non-Military Defense

An article, "Industry and Non-Military Defense," has been reprinted from the Industrial Security Magazine, the official publication of the American Society for Industrial Security.

The article outlines the actions which industrial management should take to (1) protect life and

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property in industrial plants, (2) preserve the corporate structure of business and industrial firms, and (3) promote the industrial survival program with employees and the community. It contains numerous illustrations and pictures showing industrial preparedness measures in a variety of industrial firms.

The reprint should be of special value to State and local civil defense officials in providing stimulation, guidance, and assistance to industrial firms in carrying out industrial disaster preparedness. It also is useful as a reference for developing speeches for industrial audiences.

Copies of the reprint may be obtained through ordering by title from OCDM Operational Headquarters, Battle Creek, Michigan.

Radiation Protection In Office Buildings

The Atomic Energy Commission has published a report entitled "An Experimental Evaluation of the Radiation Protection Afforded by a Large Modern Concrete Office Building, CEX-59.1." The report contains the results of a study to determine the effective shielding against nuclear fallout provided by a reinforced-concrete office building. The experimental tests were conducted early last year at the Commission's headquarters building in Germantown, Maryland.

The completed study aids in determining the best locations in the building for protection against fallout and provides experimental data on the shielding offered by modern office structures applicable to general civil defense needs.

During the experiment, conducted in February and March, 1959, fallout was simulated by use of a cobalt-60 source. The radiation source was circulated, during non-working hours, through about 5,000 feet of small diameter plastic hose placed over the ground and building in such a way as to approximate the characteristics of a radiation field.

Technical Operations, Inc. of Burlington, Massachusetts which made the survey has employed the same techniques and equipment in similar research on other types of structures for the Office of Civil and Defense Mobilization at Boston, Massachusetts, and in co-operation with the AEC at the Nevada Test Site. The data gathered will be useful to AEC in connection with civil defense considerations at its headquarters and other sites. It will also be useful in developing a standard system for assessment of protection afforded by buildings of varying structural type, for more general civil defense needs.

Test Results

The general conclusions drawn from the survey were:

1. As was expected, the shelter factor is highest in the basement of the structure where the walls were not exposed above ground. The shelter factors found typical are:

Location (center corridor)	Factor
Basement	500* to 10,000
First floor	80 to 100
Second floor	200 to 300
Third floor	250, 250**
Fourth floor	100, 50**

* Near totally exposed basement wall (no windows).

** Nontypical thin roof exists in wing A east only.

2. Complete burial of the basement wall so that the land is graded above the elevation of the first floor significantly reduces radiation penetration.

"You sure had us in stitches with your horseplay and clowning around on the job. Yes, sir, you're a card!"

3. Average conditions (i.e., the radiation field is fairly uniform in longitudinal building direction) exist beyond distances of approximately 8 ft. from the inner face of an external wall.

4. The dose rate is 5 to 10 times higher than average at the immediate inside of a window opening.

5. An additional protection factor of at least 2 may be gained on the first floor below window sill level.

6. The effect of concentrated fallout located within the shelter area in air filters and roof drains may be disastrous to shelter capability. A shelter factor of less than 1 (dose rate in shelter higher than that outside shelter) is possible in an appreciable portion of the basement if a large amount of fallout material is concentrated in the emergency air filters situated within the shelter area.

7. As a result of the measurements with a source located in the initial air plenum chamber it seems that emergency air filters could be re-installed profitably in this location outside the blastproof portion of the basement if fallout accumulations in the filter were expected to be great.

The report may be purchased from the Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. for sixty cents a copy.

Air Duct Fire Code

Recognition of new duct materials is one of the important changes in the standard on nonresidential air conditioning and ventilating systems issued by the National Fire Protection Association. The standard accepts duct materials other than metal, including flexible ducts and vibration isolation connectors. It also contains provisions applicable to the installation of ducts for high velocity systems.

Copies of the standard, Air Conditioning and Ventilating Systems of Other than Residence Type (NFPA No. 90A, 24 pages, 50 cents) may be obtained from the National Fire Protection Association, 60 Batterymarch St., Boston 10, Mass.

inside the trade

Appointment of *Ralph S. Michael, Jr.*, as manager—industrial finishes, for the *Paint Division* of *PITTSBURGH PLATE GLASS CO.* is announced by H. J. Mather, vice president—industrial sales.

Mr. Michael had served as assistant general manager—industrial finishes sales, in the company's Pittsburgh General Office since his transfer from the Milwaukee (Wis.) paint factory in 1958. He joined the Milwaukee plant as an industrial sales trainee in 1940 and later served there as assistant sales manager—industrial finishes.

L. SONNEBORN SONS, INC., New York petroleum refiner and manufacturer of chemical specialties, has changed its name to *Sonneborn Chemical and Refining Corp.*, Rudolf G. Sonneborn, President of the Company, announced. In conjunction with the name change, Mr. Sonneborn also announced a new company-developed symbol, which will be incorporated into all printed sales and corporate material of the company.

Ken E. Brock

Ken E. Brock will succeed D. W. Moor, Jr., recently deceased, to the presidency of *AMERICAN MAT CORPORATION* and *D. W. MOOR CO.*, it has been announced by the Boards of Directors of those companies. Mr. Brock, who has been vice-president and director of the companies since 1948, previously had been general manager of Hall Manufacturing Co., and affiliated with Konopak & Dalton and Ernst & Ernst.

Headquarters offices of American Mat Corporation and D. W. Moor Co. are in Toledo, and both companies are engaged in the manufacture and distribution of a wide line of floor tile, mats, and matting.

AWARD INCENTIVES, INC., well-known manufacturer of incentive emblems, trophies and awards for safety programs, has recently moved both its offices and plant facilities to new quarters at 160 Jay St., Brooklyn, N. Y. according to an announcement by Murray Nedell, founder and president of the 25-year old company. The firm was formerly located at 200 William St. in New York City.

Rogers Palmer, Vice President and Director of Marketing, has announced the appointment of *Irving Johnson* as National Equipment Sales Manager for *SNAP-ON TOOLS CORP.* The new sales organization under Mr. Johnson will operate in the area of the larger and more technical items of automotive, mechanical, and electronic equipment. The organization will consist of factory trained experts, specially chosen and schooled to operate and instruct in the operation of Snap-on equipment. Equipment salesmen, under Johnson, will work in all areas of the United States.

Louis W. Jander, formerly assistant general sales manager, has been promoted to general sales manager of *Yale Materials Handling Division, THE YALE & TOWNE MFG. CO.*, it was announced by Clyde R. Dean, division general manager. In his new post, Jander, who succeeds Dean as general sales manager, is in charge of domestic and Canadian sales of Yale's complete lines of industrial lift trucks, tractor shovels and hoisting equipment through factory branches, franchised representatives and industrial distributors.

Gerald A. Tamblyn, formerly manager of industrial tractor shovel sales development, has been promoted to assistant general sales manager, industrial trucks. Tamblyn joined the Yale sales organization in 1957 when the Materials Handling Division entered the industrial bulk handling field.

Francis O. Boufford, former western regional sales manager, has been appointed New York Branch sales manager by John Chalmers, branch manager. Appointed Yale's western regional manager in 1956, he supervised the company's field activities in western United States and Western Canada.

In 1960 *OHIO CHEMICAL & SURGICAL EQUIPMENT CO.* marks a half-century of service to the medical profession. Fifty years ago in Cleveland, Justin G. Sholes and Graham W. Clarke founded the Ohio Chemical & Mfg. Co. to make nitrous oxide, oxygen and carbon dioxide. That same year Dr. Jay A. Heidbrink, a practicing exodontist in Minneapolis, announced his first nitrous oxide-oxygen anesthesia machine. In time these pioneers were to join hands to form a nationwide organization to provide an ever expanding service to hospitals.

SWITZER BROTHERS, INC., manufacturers of fluorescent pigments, printing ink and industrial, marine and aviation paints has announced appointment of Col. *Elmo S. Mathews* (Ret.), as executive vice-president. Robert C. Switzer, president, said that the Mathews appointment fills a position designed to expedite an expansion program now under way. Mathews comes to Cleveland from the Sheffield Corp., producers of gages and other precision measuring instruments. Previously he was commanding officer of the Watervliet Arsenal at Watervliet, N. Y.

A graduate of West Point in 1928, Mathews obtained a master of science degree at California Institute of Technology in 1935, another MS degree at Massachusetts Institute of Technology in 1940, and a master's in business administration from Harvard in 1947.

Two important personnel changes in its West Coast sales organization have been made by *AMERICAN AIR FILTER CO., INC. Russell C. Taylor* has been named Pacific Regional Manager with headquarters in San Francisco. *Charles J. Bressoud* has been appointed Manager of the Los Angeles Branch Office, succeeding Taylor.

At their year-end meeting, directors of *AMERICAN DISTRICT TELEGRAPH CO.* elected *Laurence J. O'Brien* Secretary and Counsel of the Company, which specializes in electric protection against fire, burglary and holdup, on a nationwide basis. Edward F. Gaston, ADT President, also announced that Mr. O'Brien will continue as General Sales Manager.

In view of rapidly increasing demand for Underwriters' Laboratories Labeled fire safety products for public buildings, *OVERLY MFG. CO.* has established a new department to handle sales of these products and has named *Malcolm Fischer* manager. Mr. Fischer, who has been in the business of safety

and insurance for 25 years, joined Overly in 1953 as assistant sales manager. He was promoted to sales manager-Door and Frame Division in 1956.

Norman J. LeCompte has been appointed sales manager of waterproof protective clothing at *UNITED STATES RUBBER CO.*, effective immediately. He succeeds Virgil A. Wibbelsman who has retired after 40 years service with the company. Products under Mr. LeCompte's sales direction include plastic and rubber clothing. He will make his headquarters in U. S. Rubber's Washington, Ind. plant where all the company's waterproof clothing is made.

He started with U. S. Rubber in August 1946 as a salesman in Los Angeles branch. After serving in various areas of the sales department, he was transferred to Washington, Ind. in August 1959 as assistant sales manager of clothing, the position he was holding at the time of his present promotion.

Don L. Holmes has been appointed manager of the newly-formed Product Information Bureau of *THE FLINTKOTE COMPANY*, it was announced recently. Mr. Holmes assumes his new post in addition to continuing as advertising manager for the Company's industrial products.

Joseph (Joe) T. Bullock has joined the sales organization of the *FIBRE-METAL PRODUCTS CO.* in Chester, and will cover the Mid-Atlantic States of Pennsylvania, New Jersey, Delaware, Maryland and Virginia, calling on distributors of welding and safety supplies. He will reside in Ridley Park, Pennsylvania. He was formerly with the Downham Press of Chester, Pennsylvania.

Robert E. Osborn

Among the experts in the safety field invited by President Eisenhower to attend the President's Conference on Occupational Safety in Washington, D. C., was *Robert E. Osborn* of *OSBORN MFG. CORP.* Previous noteworthy assignments for Mr. Osborn include his appointment in 1958 by Governor Handley to serve on the Advisory Code Council for the Indiana State Division of Labor. This Council was created by the Indiana General Assembly for the purpose of formulating Safety and Health Codes affecting every place of employment in the State.

William J. Prohaska, president of *CHARLESTON RUBBER CO.* the past 12 years, was elevated to chairman of the board and designated director of marketing at the company's board of directors annual meeting held in February in Charleston, South Carolina. The new president is *Paul E. Belknap*, who since 1948 has been secretary-treasurer and technical director; also recently vice president. Mr. Belknap will continue as treasurer of the company. Several promotions and new positions in the company were announced after the annual meeting.

R. M. Evans, who with Mr. Prohaska and Mr. Belknap helped organize the company, was reelected vice president. *Gale M. Hallett*, appointed sales manager on January 1 this year, also was named advertising director. Added to the sales force recently have been *William J. Donigan* as technical sales representative and *Tom Richards* as sales representative.

Earl Roper has been appointed southern factory sales representative for *SELLSTROM MFG. CO., Palatine, Illinois*, manufacturers of welding and safety equipment. He will cover Alabama, Florida, Georgia, Mississippi, North and South Carolina and Tennessee.

Mr. Roper comes to Sellstrom with an extensive background in selling safety equipment for a prominent distributing organization in the south. In addition, he studied safety management at the University Center in Birmingham, Alabama. Before joining Sellstrom, he headed the distributor's safety sales division for five years.

U. S. SANITARY SPECIALTIES CORP. announces the dedication of its new Research and Development Laboratories and Sales Training Center. Taking into account the latest technological developments, these laboratories will keep the company abreast of all modern developments in the fields of floor maintenance and sanitation and will provide a first rate technical service to its customers.

A merger of the *ANTHES FORCE OILER CO.* of Fort Madison, Iowa and *GLEASON STEEL CORP.*, and *BARNES AND SMITH CORP.* of Milwaukee, Wis., has been officially confirmed by A. L. Kotler, Gleason president.

The new corporation will be known as *Gleason Corporation* with headquarters in Milwaukee. *Anthes Division, Gleason Corporation* will continue operations in expanded facilities at Fort Madison, Iowa under the direction of A. Anthes Smith with G. P. Anthes, founder, as a member of the new Board of Directors.

Wallace J. Rumick and *Catherine D. Hitchcock* head the new Southwestern Sales Office opened February 15 by *FISHER SCIENTIFIC*, America's largest manufacturer-distributor of laboratory appliances and reagent chemicals. The office, located at 1700 E. Holcombe Blvd., Houston 25, Texas, will be in continuous contact with the Fisher Central States plant in St. Louis, with its comprehensive stocks of apparatus, instruments and reagents, and its staff of technical specialists.

CONTROLS FOR RADIATION, INC. announces the appointment of the following representatives for its radiation hazard protection services: Ridge Instrument Co., 162 Tallemeda Rd., Oak Ridge, Tenn. and Scientific Systems Sales Corp., P. O. Box 3, Bayside, N. Y.

Safety Appointments

Byron M. Oyster of Tacoma, safety engineer for Weyerhaeuser Company, has retired for reasons of health, it was announced recently by Lowry Wyatt, director of personnel.

Louis B. Hoelscher, assistant training administrator, will succeed Oyster.

In 1927, Oyster began his career with Weyerhaeuser Company as personnel director and safety engineer at the Longview branch. He took over direction of company-wide safety activities at the Tacoma headquarters in 1942. He has been active in the American Society of Safety Engineers, the Veterans of Safety and the National Safety Council.

"His efforts during more than 30 years with the company have been instrumental in building an enviable safety record," Wyatt said.

Hoelscher is a graduate of the University of Minnesota. He joined Weyerhaeuser as a survey crew member at Klamath Falls, Ore., in 1941. From 1946 to 1953, he served as assistant branch forester, and in other woods operation capacities at the Coos Bay, Ore., branch. He was training coordinator and assistant administrator at Tacoma before becoming safety engineer.

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what's new for APRIL

NEW LINE OF HARD HATS

(Use Key # 665 on Inquiry Card on page 1)

NEW SAFETY HEADGEAR, available in a choice of fibre-glass, aluminum and plastic (electrical), covering a full range of standard colors, is announced by Bausch & Lomb. A contour-fit suspension, achieved by a unique design of pliable polyethylene, enables the hats to conform to the head, giving "soft-hat" comfort without top-heavy feeling. Lock straps assure minimum crown clearance of 1¼", which can be increased, if necessary. A numbered snap-in adjustment provides quick, easy fitting to any head size from 6⅝ to 8. Suspension may be left intact for cleaning and sterilization, but can easily be removed for replacement. Plastic-zippered sweatband can be taken out and replaced without affecting suspension.

The B&L fibre-glass hats and caps are lightweight, resilient and resist corrosion. In addition to durability, they have been developed with a resin-glass formula which provides fire resistance.

The B&L aluminum safety hat and cap match the fibre-glass models in lightweight comfort, and have the added advantage of heat reflection. Aluminum headgear includes a ribbing arrangement designed for maximum structural strength. The plastic (electrical) hats and caps are molded from a highly resilient linear polyethylene which assures complete insulating safety. The shell features uniform strength, and any damage is instantly visible.

NYLON COVERALLS WITH BOOTS

(Use Key # 666 on Inquiry Card on page 1)

NYLON COVERALLS with attached boots are being manufactured by M. Setlow & Son, Inc. The garments are made from lint-free white nylon pack cloth and are available either with plastic buttons or zipper front closing. They are made without pockets.

The boot is formed by continuing the back panel of the leg until it meets the sole of the boot, and by shaping the front panel of the leg to form the front of the foot. The sole is made from three thicknesses of the nylon material, cross-stitched for strength. The garments can also be made with attached gloves.

LIGHTWEIGHT FACE SHIELD

(Use Key # 667 on Inquiry Card on page 1)

A LIGHTWEIGHT, low cost face shield, Spartan, Series 6400, with polyethylene headgear, elastic headband and easy window installation, has been announced by Welsh Mfg. Co. An adjustable elastic headband permits comfortable fit on any size head, and the headgear can be worn low for additional comfort. Top band features pin lock adjustment. Fibre band with three positive snap fasteners holds clear or green acetate windows securely to wide fibre spark-guard and permits easy installation and replacement of windows.

NITROGEN DIOXIDE DETECTOR

(Use Key # 668 on Inquiry Card on page 1)

NITROGEN DIOXIDE can be detected in concentrations as low as one-half part per million by a new portable instrument from Mine Safety Appliances Co. The M-S-A Nitrogen Dioxide Detector combines a chemically-treated glass tube and an aspirator bulb to provide rapid, spot measurement of toxic concentrations from one-half to 50 parts per million. The maximum allowable concentration established by governmental industrial hygienists is five parts per million.

To perform a test, the detector tube is broken off at each end and inserted into the frame holder attached to the aspirator bulb. The inlet end of the tube is placed in the atmosphere to be measured and a sample drawn by aspiration of the bulb. One or three squeezes may be required, depending on the degree of sensitivity desired. The length of stain caused by reaction of nitrogen dioxide with the impregnated chemical is a measure of toxic concentration, and can be read in parts per million from a scale on the instrument. Sampling from a remote location is also possible with the new M-S-A detector.

Areas of exposure to nitrogen dioxide include exhausts from bright dipping and metal cleaning operations, electric arc welding, electroplating, engraving, and photogravure processes. Products of combustion in gasoline and diesel engine exhausts may contain concentrations as high as 88 parts per million.

PIPE AND ELECTRICAL MARKERS

(Use Key # 669 on Inquiry Card on page 1)

PERMANENT, easily affixed markers for pipes and electrical apparatus are available from the Seton Name Plate Co. The markers can be applied in 10 seconds and will hold fast at wide temperature extremes. They are made of non-absorbent, non-porous, and color-fast vinyl plastic. Available in a wide variety of legends and colors to cover all needs, such as fire protection equipment and materials, dangerous materials, protective materials, etc.

PLANT ODOR CONTROL

(Use Key # 670 on Inquiry Card on page 1)

A NEW AIR sanitizer to control malodor at the source is available from Turgasept Co. for sanitary maintenance use in industrial plants, food processing industries, and other areas where the control of offensive odors is a problem. Called Turgasept, it represents a totally new concept in non-selective odor suppression. The preparation does not "mask" odors nor does it replace one odor with another; instead, it combines with odor molecules to form odorless compounds. Also an antiseptic, it serves to reduce the microbial population in the area treated at the same time that it eliminates all odors.

The preparation contains no formalin-phenolic resins or floral perfumes, and has only a faint but pleasant citrus fragrance, serving to identify the space which has been treated. Its deodorant and bactericidal activities persist long after the identifying odor has been dissipated. For industrial safety, the sanitizer does not act to paralyze the olfactory organs. Available in concentrate form or individual aerosol spray cans, Turgasept penetrates the minutest openings to emulsify dirt and microorganisms, cleansing, disinfecting, and deodorizing the area treated.

PORTABLE BATTERY AIR-SAMPLER

(Use Key # 671 on Inquiry Card on page 1)

A NEW PORTABLE battery operated air sampler has been developed by Gelman Instrument Co. The air sampler frees the user from power lines and line cord. Air pump, batteries, flowmeter, filter-holder and battery charger are all contained in a durable shoulder bag. Complete unit weighs only 14 pounds. The battery air sampler allows engineers to take dust or gas samples in the field where no power lines are available. It is also useful in the plant. The user can move freely with no worries about short line cords or tangling power lines.

Switch-operated operation is simple and economical. Many months of constant usage is normal without replacing the battery. The sampler simplifies taking dust samples from tall stacks. It can be easily carried up the scaffolding or ladder to the sampling point, so that long vacuum lines or power lines are no longer needed. For breathing zone measurements the sampler can be worn by a workman with the filter holder or impinger pinned to his work clothes.

The sampler is available with a choice of batteries providing up to 3 hours of sampling on a single charge. Each sampler is equipped with 6 one-inch filter holders and quick disconnect fittings for convenient changing of filter heads. The midget air pump used in this sampler is a 6 volt carbon vane centrifugal pump. The pump requires no lubrication. A transistorized charger is built in to recharge the batteries after use.

LUMINOUS NON-SLIP SURFACING

(Use Key # 672 on Inquiry Card on page 1)

ADDITION of another safety feature to its X-L Veneer non-slip floor surface is announced by Monroe Co., Inc. The safety topping, which can be used over concrete, wood, steel, tile or terrazzo, is available in a luminous yellow. The new color, which glows in the dark, is especially effective on dark steps, ramps and depressions of any type.

X-L Veneer contains a special type of abrasive filler and aggregate that is combined with synthetic, heavy-bodied plastic base material and special solvents.

Applied on steps, inclines and floors, it forms a thin, tightly bonded veneer that is slip-resistant, whether wet or dry. Easily troweled on without primer, it is impervious to oil and grease, and resistant to gasoline, alcohol, fats and chemicals, and it is fire retardant.

MASONRY WATER-REPELLENT

(Use Key # 673 on Inquiry Card on page 1)

AN IMPROVED silicone type masonry water-repellent, Hydrocide S-X Colorless Hycon (R), which provides a marked increase in efficiency in water repellency and durability, is offered by Sonneborn Chemical & Refining Corp. It is especially resistant to the destructive alternating freeze-thaw cycles.

The company reports tests were conducted on the premise that water absorption increases upon continued exposure to freeze-thaw cycles, regardless of product or concentration of the application. The level of water absorption in masonry to which the new product was applied showed virtually no change over the entire span of exposure.

RESPIRATOR FOR PAINT SPRAY & NUISANCE DUSTS

(Use Key # 674 on Inquiry Card on page 1)

A COMPACT, new lightweight, low-cost mask for nuisance dusts and paint overspray is available from Pulmosan Safety Equipment Corp. The one size all plastic body fits all faces comfortably and does not interfere with the wearing of spectacles. The Respir-ette mask is washable and non-irritating. New plastic based disposable filters are easily replaceable, inexpensive and efficient.

CONCRETE SEALER

(Use Key # 675 on Inquiry Card on page 1)

AN EPOXY-BASED liquid coating, available from Permagile Corp. of America, penetrates deeply into the porous surface of old or new concrete floors to provide sealing protection against traffic wear and corrosive deterioration. Armorseal is a ready-to-use sealer that can be applied with an ordinary paint brush, roller or spray gun for as little as two cents a square foot. After overnight hardening, it develops a glossy, tough and flexible protective skin which prevents "dusting" or granulation of the concrete surface.

The product is reported to have exceptional resistance to fresh or salt water, oils, greases, petroleum fuels, alkali solu-

tions, fruit and vegetable juices, mild acids and a number of common industrial chemicals, thus forestalling, in many industries, expensive floor repairs or complete resurfacing. Armorseal will not flake away or disintegrate under use. Floors treated with the new product are non-sparking and possess high dielectric strength.

IMPROVED SAFETY HATS

(Use Key # 676 on Inquiry Card on page 1)

IMPROVED safety and weathering characteristics in their SuperGlas safety hats and caps are announced by The Fibre-Metal Products Co. The new safety feature is a single injection-molded polyethylene suspension unit with both a fixed safety factor of a 1¼" clearance from the crown of the hat or cap, and an additional adjustable clearance laced to fit the individual user. The entire suspension, including headband, is comfortable, rugged and easy to clean.

The polyethylene suspension only occasionally requires replacement of the headband and sweatband and is interchangeable in all styles of Fibre-Metal hats and caps, both new and those now in use. An added veil of fine-spun glass fibres placed near the outer surface of the shell increases the life of the shell, makes the color more lasting, and the surface more resistant to abrasion.

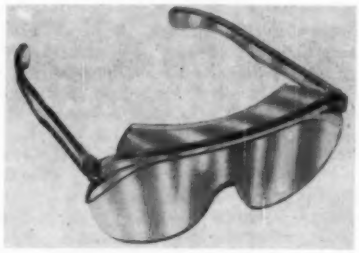
AIR-PARTICLE MONITOR

(Use Key # 677 on Inquiry Card on page 1)

AN ATMOSPHERIC-PARTICLE counting instrument has been designed by Royco Instruments, Inc. for application to the continuous monitoring of outdoor air or atmospheres of indoor locations, such as ultra-clean work areas. It presents, on a strip-chart recorder, a permanent record of aerosols present in an over-all range from 0.3 microns to any desired upper limit. This record is differentiated into 15 sub-ranges and recorded in sequence at intervals which can be predetermined in length. Stability problems are eliminated by the fact that the unit is continuously self-calibrated.

Included in the instrument is an alarm system which can be set for a remote indication of particle concentrations in any of the monitored sub-ranges exceeding a predetermined maximum.

Counting rate of the PC-200 is 1000 particles per minute with a 1 percent coincidence loss at the standard flow rate of 100 cc per minute. Recordings are made on a 6-in. strip chart at a standard movement of 8 in. per hour. Operation is from a 115-v 60-cps supply with a current of 3 amp.



LIGHTWEIGHT SAFETY SPECTACLE

(Use Key # 678 on Inquiry Card on page 1)

INEXPENSIVE, lightweight industrial eye protection that can be worn all day with ease and comfort, even over prescription glasses, are features of a new VS3 Visitor Spec. from Willson Products.

The design combines utility and modern styling, and the VS3 can be worn for frontal eye protection against light impacts, foreign particles, or dust hazards. The wide brow rest and .080 inch thick lens is of one piece construction for more dependable service. Library type temples are universal fitting for any size or shape head.

In addition to protecting the eyes of plant visitors, new VS3 Visitor Spec. glasses can be used for eye protection for anyone working with wood, buffing, spot welding, inspections, etc. The glasses are available with green lens for protection against heat and harmful glare.

ANTI-FATIGUE SUGAR TABLETS

(Use Key # 679 on Inquiry Card on page 1)

FRUCTOSE, or fruit sugar, is available, through improved processing procedures developed by Pfanstiehl Laboratories, at sufficient economy to make feasible its widescale distribution to workers, athletes and others who require an effective quick energy dietary supplement.

Generally considered to be the most rapidly metabolized sugar known, it is reported to bring the blood sugar level up beyond normal and recession is gradual over a longer period of time, as compared with dextrose. The product, in the form of Frutabs, is processed from honey, and is neither a drug, stimulant, nor habit forming. As in the case of salt tablets, its dispensal is viewed as an aid to production.

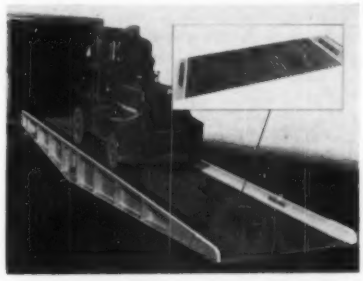
MONITOR FOR REFRIGERATION & AIR CONDITIONING EQUIPMENT

(Use Key # 680 on Inquiry Card on page 1)

AN ELECTRONIC device which will lower operating and maintenance costs of refrigeration and air conditioning systems, is reported from the Televance Corp. The Televance Sentry is designed to keep a constant watch over these systems and to signal the operator at the outset of equipment failure or inefficiency, thus checking costly chain reactions.

The device detects such conditions as: refrigerant leaks, inefficient compressor, broken or badly slipping v-belts, a flash gas condition, a tripped reset or motor overload device, defective motor, blown fuse, etc. In some cases, it is claimed that the Sentry will signal service requirements up to months in advance of actual equipment failure.

Mechanism consists of a sensing probe and a main electronic control unit. A multiple selector switch permits up to five condensing units to be connected to a single Sentry. A low voltage remote alarm is also available. Operation of the device can be determined by pressing a test button.



OPEN-GRATING RAMP

(Use Key # 681 on Inquiry Card on page 1)

A NEW SERIES of Mobile Loading Ramps featuring a heavy-duty, all-grating surface is announced by Magline Inc. The open grating ramp is self-cleaning—designed to permanently elminate build-up of snow, ice, mud, oil or grease, and to provide a safe, clean, all-weather traction surface. The surface, a patented feature, extends from curb to curb throughout entire length of traction area. Serrated tracks are set into the grating surface to provide positive wheel traction, and are available in varying tread widths to meet power equipment requirements.

The units are made of lightweight magnesium for one-man handling and are available in two widths, 58" and 70", and in thirty and thirty-six foot lengths. Ramp capacities range from 7,000 to 20,000 pounds or more when required.

Additional features include: 4½" high curbs to prevent power truck run-off, hydraulic lift system for easy positioning, 18" wheels with high speed bearings and pneumatic tires, spring loaded safety chains that lock Ramp securely to carrier, and other engineering features which facilitate smooth, safe, power loading.

THERMAL INSULATION CEMENT

(Use Key # 682 on Inquiry Card on page 1)

A CASTABLE quick-set, one-coat insulation cement, available from Thermold Products Co., can be handpacked, troweled, injected, palmed, sprayed or poured to any thickness without shrinkage. In addition, the set or dried material may be reused.

This cement, the company states, is capable of withstanding freezing temperatures with no deteriorating effects. It is non-rusting and non-corrosive to metal and materials. The product may be applied to such hard-to-cover materials as fiberglas board, rock cork board, foam glass block, rock wool blanket, etc., without the use of hex wire. It will not shrink, blister or drip, and will provide a smooth hard finish.

Pre-molded jackets for pipe fittings can be made in two pieces and easily applied. Uniformity and durability are cited by the company as further assets of their product.

PLASTIC DRUM-FILLING COVER

(Use Key # 683 on Inquiry Card on page 1)

A POLYETHYLENE drum filling cover to prevent dangerous and costly spillage is being manufactured by the Delaware Barrel and Drum Co. The lightweight, corrosion-proof cover—available in 15, 30 and 55 gallon sizes—will fit all standard fill lines on steel, fiber and polyethylene drums, and is designed to collect and hold overflow due to fill line breakdowns, leaky valves and careless operators. Unbreakable, translucent cover, with built-in handles and molded pouring lip, has a high chemical resistance.

NEW SOUND SHELTER

(Use Key # 684 on Inquiry Card on page 1)

A SOUND SHELTER, featuring portability and low price, has been introduced by Maico Electronics, Inc. The unit is designed to serve doctors, hospitals and schools where acoustic protection is needed for audiometric testing. Noise level in doctor's offices averages 60 decibels or less, and the shelter offers satisfactory audiometry in environmental noise to 65 decibels. Unit moves easily and quietly on rubber-wheeled, ball-bearing, swivel casters.

Shipped completely assembled, the Sound Shelter has a 24 by 24 by 70-inch interior which easily accommodates a patient seated in an armchair. It includes a complete jack panel for audiometer accessories and a glass observation window. Its ¼-inch plexiglass door closes on magnetic catches. Applications include service as an enclosure for supervisors in noisy machine shops.

HIGH VISIBILITY WARNING PAINT

(Use Key # 685 on Inquiry Card on page 1)

BRIGHT COLORS, used strategically throughout industrial plants and other hazard encompassing areas, are a strong deterrent to accidents which occur most frequently when the mind becomes lulled by long term repetitive action. A complete line of high-visibility fluorescent safety colors, developed by Lawter Chemicals, Inc., is designed to point up the specific dangers prevalent. HI-VIZ paints, applied with any of the normal painting methods, require only a white undercoat to assure their full fluorescence.

These new paints will last indefinitely indoors and, with the aid of a Uvitron, a protective sealer, up to two or more years outdoors, the company reports. The company has adapted A.S.A. recommendations for marking physical hazards, accident prevention signs and the coding of pipes. A total of eight colors includes those which may be used on fire protection apparatus, emergency stops on machines, flammable liquid containers, low beams, tractors, locomotives, first-aid and safety equipment, etc.

COMPRESSED AIR OR STEAM VACUUM

(Use Key # 686 on Inquiry Card on page 1)

A MULTI-PURPOSE, air-operated high suction vacuum cleaner for use with compressed air or steam is available from Kimco Products Co. Called Air-Vac, it may be used for all types of industrial cleaning, railroad cars, plating tanks, drainage gutters, cracking towers, grease traps, boilers, tanks, sumps (including machine tool and paint spray booth sumps), and floors. High vacuum and suction are attained through a Venturi air-jet system which eliminates electric motors and moving parts, as well as maintenance and fluctuations in vacuum.

The new unit can pick up liquids at rates up to two gallons per second, and fluid lift to 25 feet. It will pick up dry materials such as sand at rates up to 125 lbs. per minute. Among the materials Air-Vac can handle are: coolants, oils, molasses, solvents, heavy sludge, talc, chips, water, grease, dry or wet sand, graphite, grit, plastics, fats, resins, welding flux and rubber dust.

All material, wet or dry, is deposited into a 55 gallon drum or similar container. Four sizes of hoses are available, from 1½" to 4", to permit the machine to be used for any cleaning or conveying job. It is easily portable, and is available with multiple heads for specialized applications.

DISPOSABLE COTTON GARMENT

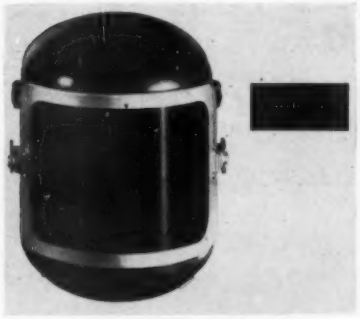
(Use Key # 687 on Inquiry Card on page 1)

A DISPOSABLE cotton garment, is available from B. H. Jordan Co. at a price reported to be below the cost of laundering. This garment, made of bonded nonwoven cotton hangs 44" from the shoulder to below knee length. Its poncho construction with side vents assures maximum protection in front and back. Suggested for use as a coat for shop personnel, butchers, printers, etc.

TWO-SIZE SAFETY SPECTACLES

(Use Key # 688 on Inquiry Card on page 1)

MADE TO FIT every face easily, Unispec Twins safety spectacles incorporate many new features. Developed by Glendale Optical Co., the glasses are available in two models which cover five bridge sizes. Model 7446 fits 18, 20 and 22mm bridge sizes; Model 7448 fits 22, 24 and 26mm bridge sizes. Each model fits a 22mm bridge size.



PLASTIC FILTER FOR ARC WELDING

(Use Key # 689 on Inquiry Card on page 1)

PLASTIC-WELD filters remove the harmful ultra-violet and infrared rays of arc welding and filter them to the same degree as the standards set for glass in Federal specifications. Available from Chicago Eye Shield Co. in the standard 2" x 4½" size and a 7" x 11" panoramic window version, these filters will outlast glass by as much as 6 to 1 because of less breakage due to dropping, impact and thermal shock. Compared with glass, Plasti-Weld filters have equal clarity and definition of outline. They are also lighter weight. Suitable for conventional welding helmets.

RUBBISH BURNER

(Use Key # 690 on Inquiry Card on page 1)

FOUR BUSHELS is the capacity rating for the new Burnzit Jumbo outdoor rubbish burner manufactured by Wolverine Feeder Co. The 40" high and 26" wide unit is designed for large homes, commercial establishments, apartment houses, schools, factory offices, etc. It is constructed of aluminized steel to resist heat and corrosion. Top and bottom are reinforced with heavy steel rod. Grate is welded steel. The Burner is equipped with handles and a cover hook.

IMPROVED STATIC ELECTRICITY NEUTRALIZER

(Use Key # 691 on Inquiry Card on page 1)

AN IMPROVED anti-static formula is available packaged in self-spraying cans or bulk for use in neutralizing static electricity. Manufactured by Statikil, Inc., the product may be used for electronic business recorders, industrial machinery, meters, indicators, plastic materials and machinery, paper stock manufacturing and printing machinery, photographic dryers and developers, textile materials and machinery, etc. In addition, Statikil is effective as a spark retardant in hazardous operations like mining, arsenals, chemical, petroleum and other industries.

On especially difficult operations, bulk Statikil can be sprayed through compressed air pressure nozzles directly upon the surface of material as it comes from

machinery. This is an economical way to reduce static for all subsequent operations where the material goes through a multiple series of operations. It is also possible to apply the product by swabbing, wiping, spraying with hand pump or power spray or by fogging onto material by means of fully automatic jet nozzles.

SAFETY LATCH FOR LARGE HOOKS

(Use Key # 692 on Inquiry Card on page 1)

A RECENTLY introduced line of safety latches for converting standard hoist hooks to safety hooks has been expanded by The Harrington Co. to include eight new sizes for larger hoist hooks. The safety latches are available from stock for in-

dustrial, foundry, material handling and similar hoist applications, in hook sizes from ¼ ton through 10-ton. Sizes above 10-ton capacity are made to order.

The inexpensive safety latches are fitted on any hook in a matter of minutes. Only hand tools are required. Simple in design, the safety device for preventing accidental dropping and detaching of loads has only two major parts, a clamp-on collar and a spring-loaded safety latch which fits into the hook opening. The clamp-o collar conforms easily to any hook-shank shape. Lugs on both sides of the latch permit operation of the device without need for putting fingers into hook openings.

ELECTRICAL HARD CAPS

(Use Key # 693 on Inquiry Card on page 1)

INJECTION MOLDED, all plastic hats and caps, individually dielectrically tested to meet E.E.I. Specification AP-1 1959, are available from Davis Emergency Equipment Co., Inc. Extremely lightweight and with no metal parts, the new Dielectric Hedgard hats and caps are strong enough to withstand repeated 40 ft. lb. impact tests. Molded lugs on the brim permit the attachment of chin straps.

The new models utilize a plastic snap-in suspension which holds the hat securely by gripping low on the back of the head, and permits adjustment for head sizes 6½ to 7¾, and adjustment of suspension on either side for added comfort. This feature also allows easy cleaning or sterilization, and replacement of leather or leatherette sweatband.

NEW FLOOR ABSORBENT SAMPLES

(Use Key # 694 on Inquiry Card on page 1)

A SPECIALLY PROCESSED sanitary mineral clay for absorbing oil and grease is offered by Canfield Oil Co. Spread on wood, metal, or concrete floors, just ⅛" thick, Oil Spunj absorbs soluble oil, lubricating oil, grease, acids, and chemicals. The granules stay on the floor until saturated, then are easily swept off. Can be re-used with soluble oil.

According to the manufacturer, the special mineral clay used plus the unique method of processing gives the product its extreme bulk per weight, high soluble oil retention, and large floor coverage per lb. U. L. approved. Free samples available.

zone mail indeed results in speed

The Post Office has divided 106 cities into postal delivery zones to speed mail delivery. Be sure to include zone number when writing to these cities; be sure to include *your* zone number in *your* return address — after the city, before the state.

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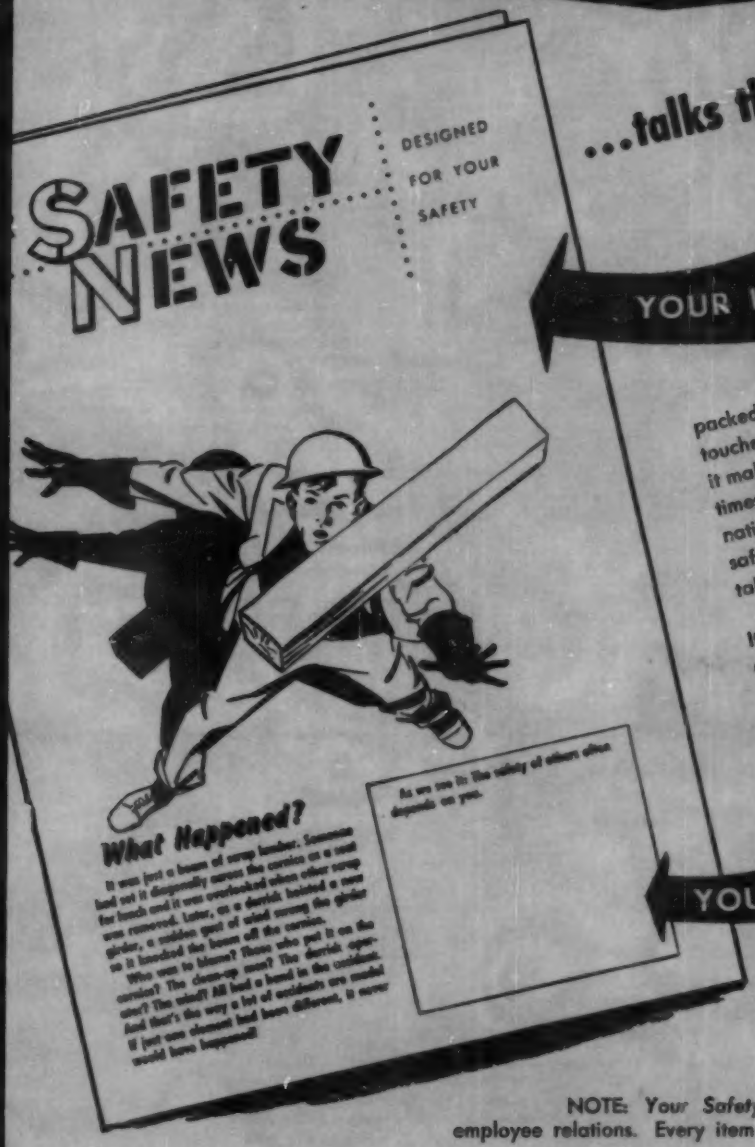
SEND THIS PERSONAL SAFETY MESSAGE TO EVERY ONE OF YOUR EMPLOYEES.

- Safety is made appealling . . . vivid . . . engaging . . . colorful!
- Each worker clearly sees how safety benefits him . . . how doing his part helps others!
- You get enthusiastic safety cooperation instead of tolerance . . . from every employee . . . every month!



. . . talks the worker's language!

YOUR IMPRINT HERE!

packed with pictures, alive with animated cartoons, touched with humour that gives snap to your message, it makes safety interesting and down to earth. Twelve times a year it covers accident hazards. Across the nation leading industrial firms state it's the only safety paper their employees will read . . . and take home to their families.

It gives the employer the advantages of personal contact . . . saves time and expense. One "lost time" accident prevented . . . more than pays for the yearly cost! Try it . . . it works!

YOUR SIGNATURE HERE!

Make Your Safety News your own publication . . . your good will ambassador . . . working for you toward better industrial relations. If you wish, your facsimile signature can be printed here to identify you with the message that gets next to your men and boosts morale.

NOTE: *Your Safety News* **is designed to promote better employer-employee relations. Every item is carefully weighed and tailored to this viewpoint!**

INSIDE PAGES
(Pages 2 and 3)

THOUGHTLESSNESS IS A THIEF
He'll steal his way into what you're doing, distract your attention and walk off with a finger, arm, eye or foot. Thoughtlessness takes many forms: it may be daydreaming, or worry about some personal problem, or just plain inattention. Anything that distracts you, especially around machinery, is a thief of your personal safety.
PLAYFULNESS IS A PIRATE
He is a deceptive rascal. His hi-jinks may put him in the spotlight, but his practical jokes and showing-off often result in serious bodily injury and even death. And note this: he, himself, has lost a leg! As so often happens, horseplay can boomerang and the practical joker gets hurt too!
What You Should Know About Carbon Monoxide
This is a picture of carbon monoxide gas!
That's right, you can't see it. It's colorless, non-irritating, tasteless, practically odorless, but also deadly.
Here are the symptoms of carbon monoxide poisoning: First, a tight feeling across the forehead, followed by headache, throbbing temples, weariness, weakness, dizziness, nausea, loss of muscular control, increased pulse and breathing. BUT if the concentration of the poison gas is high, there may be loss of consciousness without these warning signals.
Just a few breaths of air containing 1% carbon monoxide can be fatal . . . so can one part of carbon monoxide in a thousand parts of air when breathed for 90 minutes.
It is possible for carbon monoxide to leak inside of a car if there is a loose exhaust pipe or manifold connection, blown-out exhaust gasket, cracked exhaust manifold, or leaky muffler. Play it safe.
1. Be sure your muffler and exhaust are in good condition (they can leak long before they become noisy).
2. Always keep a car window open, even a little, for fresh air.
AN INTIMATE LOOK AT FOUR VILLAINS
SAFETY LAZINESS IS A SIMON LEGREE
If you are lazy about safety rules, then accidents will have the whip hand. We are safety-lazy when we don't bother to use mechanical guards, to take time to get the right tools for the job, to wear protective equipment such as goggles, hard hats, safety shoes, respirators, gloves, etc. Yes, Simon Legree has a whole pack of accident hounds to trail you.
HAZARDOUS METHODS ARE A HOLD-UP MAN
This villain, unsafe work habits, likes to lie in ambush for the unwary. But how do we fall into bad working habits? It may be by trying to cut corners, by wanting to keep to the old way of doing things, or by over-confidence. It's hard for anyone to believe that an accident can happen to him. It's easier to make excuses to ourselves for ignoring safety rules, but alibis only lead us up a blind alley with an accident waiting in ambush.
Two Excellent Reasons
For Wearing Safety Shoes

EMPHASIZES SELF INTEREST

Your employee's self interest in his own safety is always emphasized. Constant safety consciousness is promoted by covering household hazards, transit to and from the job and on the job caution against accidents.

CLEVERLY ILLUSTRATES THE POINT

Artwork is carefully chosen to lodge home each point persuasively. The cartoon style makes YOUR SAFETY NEWS as familiar and welcome as the picture packed Sunday supplement.

WINS READERS WITH A FOLKSY APPROACH

Keeping the contents folksy, adding the light note of humor, gets your message across with a nudge instead of a bludgeon. Your monthly chat gets enthusiasm instead of indifference.

RIVETS ATTENTION WITH VIVID COLOR

Generous use of color sparks the message, and adds impact to the contents of YOUR SAFETY NEWS. Each issue is as alive as any news-stand favorite.

HOW TO ORDER:

YOUR SAFETY NEWS may be ordered with either the standard imprint or with your Own Special Imprint. The standard imprint reads "PLEASE COOPERATE FOR THE SAFETY AND HEALTH OF ALL . . . signed . . . A SAFE WORKER."

You can personalize YOUR SAFETY NEWS with the name of your firm and the name or facsimile signature of a company representative as illustrated. Give full instructions for your Special Imprint on the order blank below:

Item (1) FIRM NAME: Please show the name of your firm exactly as it is to appear.

Item (2) INDIVIDUAL NAME OR SIGNATURE: (If Desired). On a sheet of white paper, please show, in black ink, the individual name or signature, if desired, which is to appear each month on the first page of YOUR SAFETY NEWS.

NOTE: Although a personal signature is effective, some firms substitute: SAFETY DEPARTMENT, YOUR SAFETY COMMITTEE, A SAFE WORKER, etc.

CUT OUT AND MAIL TODAY!

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☐ Special Imprint ☐ Standard Imprint

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Armortred NEOPRENE Cord Soles and Heels

NEW SAFETY and WORK SHOE SOLE BY QUABAUG

(For details, use Key # Q-26 on card on page 11)

DUPONT NEOPRENE TIRE CORD

Combined for Protection against

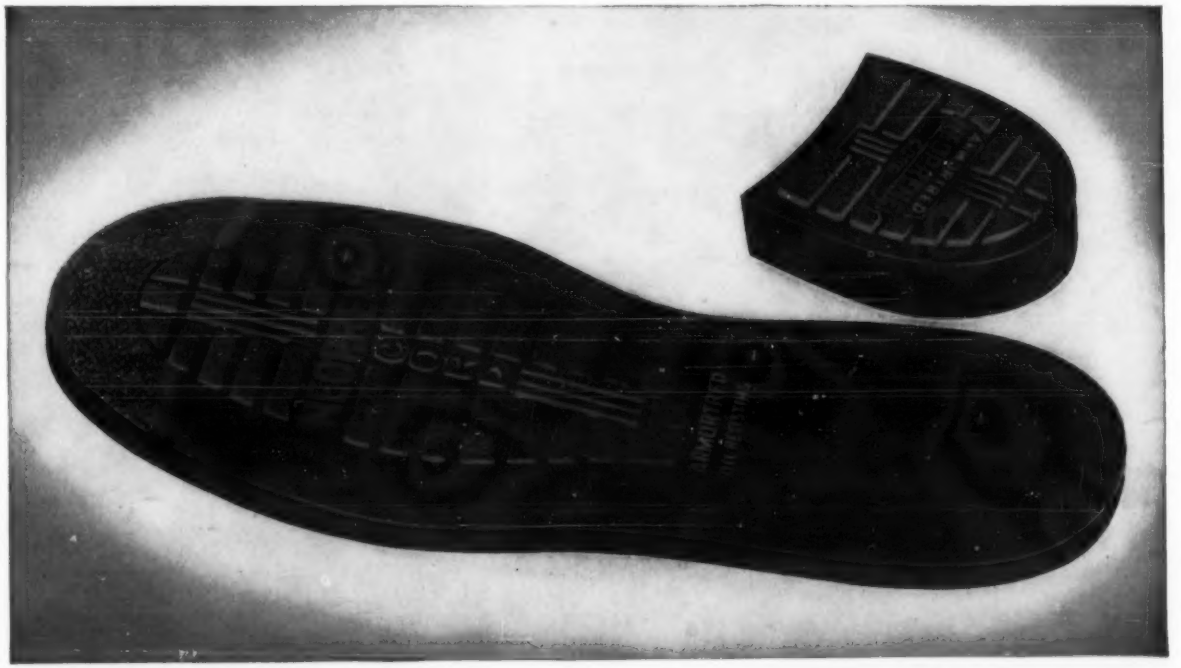
OILS—HEAT—ACIDS

LONG RUGGED WEAR

and a SAFE SURESTEP

SMART for STYLE

14 & 18 IRON BLACK or BROWN with or without Red Label



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There is no short cut to quality

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313 N. FIRST STREET
ANN ARBOR MICHIGAN
12-60
ECK SMP

for
fever blisters
and
canker sores of
herpetic origin . . .

LACTINEX®

Mixed culture of Lactobacillus acidop[illegible]d bulgaricus with metabolic enzymes naturally produced.

ALSO SUCCESSFUL CLINICAL RESULTS IN DIARRHEAS . . .

Lactinex is effective in uncomplicated diarrhea, including that resulting from antibiotic therapy.[1]

Weekes[2] reports successful treatment with Lactinex of fever blisters and canker sores of herpetic origin.

SUPPLIED: *Tablets in bottles of fifty; Granules in boxes of twelve one gram packets.*

1. Siver, R.H.: Current Medical Digest, Vol. XXI, September 1954.

2. Weekes, D.J.: New York State Journal of Medicine, Vol. 58, August 1958.

HYNSON, WESTCOTT & DUNNING, INC.

BALTIMORE 1, MD.

(For details, use Key # Q-27 on card on page 1)